S5 Home Economics Practice Paper

S5 | Home Economics | Time: 75 minutes | Total: 100 marks | 24 questions

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Part 1 Nutritional Needs and Diet-related Diseases (17 marks)

Read each case, show your working and answer.

1. A woman weighs 65 kg. Her basal metabolic rate is estimated as 0.9 x body weight (kg) x 24 hours and her physical activity level is 1.55. Find her BMR and her total daily energy expenditure.

Answer: BMR = 0.9 x 65 x 24 = 1,404 kcal. Total daily energy expenditure = 1,404 x 1.55 = 2,176.2 kcal. Eating more than this over time stores the surplus as body fat.

2. An adult man is 1.72 m tall and weighs 78 kg. Calculate his BMI and state his weight category.

Answer: BMI = mass / height^2 = 78 / 2.9584 = 26.37. For Asian adults 23.0-24.9 is overweight and 25.0 or above is obese, so he falls in the obese category and should adjust diet and activity.

3. A person takes 2,100 kcal a day with protein supplying 15% of energy. Find the daily protein intake in grams and comment on its adequacy against a reference of 0.8-1.0 g per kg body weight.

Answer: Protein energy = 2,100 x 15% = 315 kcal, and at 4 kcal per gram that is 78.75 g. Per kg = 78.75 / 65 = 1.21 g/kg, above the 1.0 g/kg reference, so intake is adequate and even surplus; excess protein is used for energy or stored as fat.

4. Three meals supply 1,200 mg, 1,500 mg and 900 mg of sodium. Find the total sodium, convert it to grams of salt (sodium x 2.54 / 1000) and compare with the 5 g daily limit.

Answer: Total sodium = 3,600 mg, equal to 3,600 x 2.54 / 1000 = 9.14 g of salt, which exceeds the 5 g limit by 4.14 g. Habitual high sodium raises blood pressure and the risk of stroke and heart disease, so processed food and condiments should be cut down.

Part 2 Therapeutic Diet Design (17 marks)

The questions concern diabetic, low-sodium and special-need diets.

5. A diabetic patient needs 2,000 kcal a day and the dietitian sets carbohydrate at 45% of energy, the rest coming from protein and fat. Find the daily carbohydrate allowance in grams.

Answer: Carbohydrate energy = 2,000 x 45% = 900 kcal, so 900 / 4 = 225 g. Low glycaemic index choices such as brown rice and wholemeal bread, spread evenly across meals, keep blood glucose steady.

6. A dish uses 20 ml of soy sauce containing 5,700 mg sodium per 100 ml. Find the sodium and the equivalent grams of salt, then suggest one way to reduce it.

Answer: Sodium = 5,700 x 20 / 100 = 1,140 mg, equal to 2.90 g of salt, already 58% of the 5 g limit. Reduce it with low-salt soy sauce, flavour with ginger, garlic and herbs, or halve the amount used.

7. A vegetarian needs 60 g of protein a day, with 40% from legumes and the rest from cereals. Find the protein from each group and explain protein complementation.

Answer: Legumes = 60 x 40% = 24 g and cereals = 60 - 24 = 36 g. Legumes are low in methionine but rich in lysine while cereals are the reverse; eaten in the same meal the two complement each other into a complete amino acid profile and raise protein utilisation.

8. The iron reference intake for adult women is 18 mg a day and rises to 27 mg in pregnancy. Find the percentage increase and name two iron-rich foods.

Answer: Increase = (27 - 18) / 18 x 100% = 50%, needed because blood volume rises and the fetus builds its own blood. Iron-rich foods include red meat, liver, dark green leafy vegetables, legumes and fortified cereals; vitamin C aids absorption of non-haem iron.

Part 3 Textile Fibres and Garment Selection (17 marks)

The questions cover fabric cost, fibre properties and care labels.

9. A uniform needs 2.4 m of main fabric at $68 per metre, 0.6 m of lining at $45 per metre and $180 of tailoring. Find the cost and the selling price with a 20% mark-up.

Answer: Main fabric = 2.4 x 68 = $163.20; lining = 0.6 x 45 = $27.00; cost = 163.20 + 27.00 + 180 = $370.20. Selling price = 370.20 x 1.2 = $444.24.

10. Cotton has a moisture regain of about 8.5% and polyester about 0.4%. Find the ratio and explain what this means for close-fitting summer clothing.

Answer: Ratio = 8.5 / 0.4 = 21.25 times. Cotton absorbs far more moisture, wicking sweat and heat away so it feels drier and cooler next to the skin; polyester absorbs almost nothing, so sweat stays on the skin, yet it dries fast and resists creasing, suiting outerwear or sports shells.

11. A cotton top uses 0.35 kg of cotton yarn at $96 per kg; a polyester top uses 0.28 kg at $52 per kg. Find both material costs and the difference.

Answer: Cotton = 0.35 x 96 = $33.60; polyester = 0.28 x 52 = $14.56; difference = $19.04, cotton costing 131% more. Selection should weigh durability, care cost and comfort, not material price alone.

12. A care label shows: maximum wash 40 degrees C, do not bleach, tumble dry low, iron at medium heat. Explain what each instruction protects.

Answer: Washing at 40 degrees C removes soil without shrinking fibres or fading dye; no bleaching protects dyes and fibre strength; low tumble drying prevents heat shrinkage and distortion; medium ironing smooths creases without scorching or melting synthetics. Following the label extends garment life and cuts waste.

Part 4 Fashion Design and Cultural Influence (17 marks)

The questions concern colour planning, production cost and cultural elements.

13. A 24-piece collection uses a main colour for 50%, a secondary colour for 33% and an accent for the remainder. Find the number of pieces in each group as whole numbers.

Answer: Main = 24 x 50% = 12 pieces; secondary = 24 x 33% = 7.92, i.e. 7 pieces; accent = 24 - 12 - 7 = 5 pieces. The main colour sets the mood, the secondary adds depth and the accent draws the eye; an unbalanced ratio loses coherence.

14. A dress costs $4,800 to sample, $135 in material and $85 in labour per piece, with a first run of 100 pieces. Find the total and the average cost per piece.

Answer: Total = 4,800 + 100 x (135 + 85) = $26,800, so the average is 26,800 / 100 = $268.00 per piece. The sampling fee is fixed, so a larger run spreads it thinner.

15. A fast-fashion top sells for $120 and is worn about 7 times; a durable design sells for $480 and is worn about 30 times. Find the cost per wear and comment on which choice is more sustainable.

Answer: Fast fashion = 120 / 7 = $17.14 per wear; durable = 480 / 30 = $16.00 per wear. The figures are close, but the durable piece means fewer production runs, shipments and discards, so its resource use and carbon footprint are lower and it is the more sustainable choice, especially if the style is classic and repairable.

16. A designer wants to print an indigenous people traditional motif on a commercial range. Explain the difference between cultural appropriation and appreciation, and give two responsible practices.

Answer: Appreciation means learning about, respecting and crediting a culture; appropriation takes elements with sacred or identity meaning for commercial gain without consent or context. Responsible practice: obtain community consent with a benefit-sharing agreement, and involve cultural consultants in design, credit the source clearly and return part of the revenue to the community.

Part 5 Family Resources, Savings and Investment (16 marks)

The questions concern deposits, emergency funds, inflation and saving rate.

17. $80,000 is placed in a fixed deposit at 3.2% per year compounded annually for 2 years. Find the maturity value and the interest earned.

Answer: Maturity value = 80,000 x (1 + 0.032)^2 = $85,201.92. Interest = 85,201.92 - 80,000 = $5,201.92. Compounding earns interest on the first year interest too, so it exceeds simple interest of $5,120.00.

18. A family spends $14,500 a month and the adviser recommends 6 months of expenses as an emergency fund. Find the fund size and say where it should be held.

Answer: Emergency fund = 14,500 x 6 = $87,000. It belongs in low-risk, readily accessible instruments such as savings or current accounts, short fixed deposits or money market funds, not in volatile equities that might have to be sold at a loss when cash is needed.

19. With inflation at 3% a year, find the purchasing power of $100 after 10 years (2 decimal places) and explain the implication for savers.

Answer: Purchasing power = 100 / (1 + 0.03)^10 = $74.41, so the same money buys only about $74.41 of goods after ten years. If the deposit rate is below inflation, real purchasing power falls, so savings should include tools that can outpace inflation while spreading risk.

20. A family earns $22,000 and spends $14,500 a month. Find the saving rate and suggest three ways to raise it.

Answer: Savings = 22,000 - 14,500 = $7,500, so the saving rate is 34.09%. Ways to raise it: track spending and cut non-essentials, set an automatic transfer on payday to save first and spend later, and shop around on utilities and insurance to lower fixed costs.

Part 6 Consumer Rights and Green Consumption (16 marks)

The questions cover water use, energy labels, warranty rights and carbon footprint.

21. Making one cotton T-shirt uses about 2,700 L of water. A person buys 12 a year: find the annual virtual water use and suggest two ways to reduce it.

Answer: Annual water = 2,700 x 12 = 32,400 L. Reduce it by extending each garment life through repair, hand-me-downs or resale, choosing recycled or certified cotton, and avoiding impulse purchases.

22. A washing machine rated 1,200 W runs 1.2 hours per wash, 5 times a week, with electricity at $1.2 per kWh. Find the weekly energy use and the annual cost over 52 weeks.

Answer: Weekly energy = 1,200 x 1.2 x 5 / 1000 = 7.2 kWh, costing 7.2 x 1.2 = $8.64 a week or $449.28 a year. A Grade 1 energy label and cooler wash cycles save more.

23. An appliance has a 12-month warranty and fails through no fault of the user in month 14. State the consumer rights that may apply and the action to take.

Answer: Expiry of the warranty does not end all liability: the Sale of Goods Ordinance requires goods to be of merchantable quality and reasonably durable. If the fault is a design or manufacturing defect, free repair, replacement or refund may be claimed. Keep the receipt and warranty card, notify the seller in writing with a record of the fault, and if refused complain to the Consumer Council or pursue the claim at the Small Claims Tribunal.

24. The same jacket has a carbon footprint of 1.2 kg CO2e if made locally and 14 kg CO2e if flown in. Find the ratio and explain why.

Answer: Ratio = 14 / 1.2 = 11.67 times, because air freight emits far more per tonne-kilometre than sea or road transport, and long-haul fuel use plus cold chain and packaging inflate the total. Local production, sea freight and less returns and packaging cut emissions.
