S3 Technology and Living Practice Paper: Food Nutrition and Energy Calculation, Meal Planning and Menu Design, Food Safety and Preservation, Fibres and Fabric Costing, Garment Construction and Patterns, Family Resources and Consumer Choice

S3 | Technology and Living | Time: 60 minutes | Total: 100 marks | 24 questions

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Part A - Food Nutrition and Energy Calculation (18 marks)

Show all working and units in calculation questions.

1. A breakfast contains 20 g protein, 60 g carbohydrate and 15 g fat. Using 4 kcal per gram for protein and carbohydrate and 9 kcal per gram for fat, calculate the total energy. [5]

Answer: Energy = 20 x 4 + 60 x 4 + 15 x 9 = 80 + 240 + 135 = 455 kcal.

2. For a 2,000 kcal daily intake, fat should provide no more than 30%. Calculate the daily fat limit in grams (1 decimal place). [5]

Answer: Fat energy limit = 2,000 x 30% = 600 kcal; fat limit = 600 / 9 = 66.7 g.

3. For a person weighing 50 kg, the recommended protein intake is 0.8 g per kg of body weight. Calculate the daily protein requirement and name one protein-rich food. [4]

Answer: Requirement = 50 x 0.8 = 40 g; examples: eggs, lean meat, tofu, fish or milk.

4. Explain two functions of dietary fibre and state a problem caused by a lack of fibre. [4]

Answer: Functions: adds bulk to stool, promotes peristalsis, prevents constipation, slows blood sugar rise and increases satiety. Lack of fibre causes constipation and raises long-term risk of bowel disease.

Part B - Meal Planning and Menu Design (16 marks)

Show working in calculation questions; answer the others in full sentences.

5. A dinner provides 700 kcal. Taking 2,000 kcal as the daily requirement, calculate the percentage of daily energy it supplies. [4]

Answer: Percentage = 700 / 2,000 x 100% = 35.0%.

6. Design a balanced lunch for an S3 student containing four food groups and explain the role of each. [4]

Answer: E.g. brown rice (cereals: carbohydrate and energy), steamed fish (protein foods: growth and repair), stir-fried vegetables (vitamins, minerals, fibre) and low-fat milk (calcium and protein).

7. Compare home-prepared and takeaway lunches in terms of two differences in nutritional control and cost. [4]

Answer: Home cooking allows control of oil, salt and sugar and uses fresh ingredients, giving better balance at the cost of time; takeaway saves time but often contains more oil, salt and sugar and costs more in the long run.

8. Explain two points to note when planning meals for elderly people. [4]

Answer: Food should be soft and easy to chew and swallow (minced or well cooked); reduce oil, salt and sugar while ensuring adequate protein and calcium; serve small frequent meals and watch fluid intake and food temperature.

Part C - Food Safety and Preservation (16 marks)

Show working in calculation questions; answer the others in full sentences.

9. The refrigerator compartment is at 4 degrees and room temperature is 25 degrees. Calculate the temperature difference and explain why low temperature slows food spoilage. [4]

Answer: Difference = 25 - 4 = 21 degrees. Low temperature slows microbial growth and enzyme reactions, so food spoils more slowly.

10. A 150 W refrigerator runs its compressor 8 hours a day. At $1.2 per kWh, calculate the electricity cost for 30 days. [4]

Answer: Energy = 150 x 8 / 1,000 x 30 = 36 kWh; cost = 36 x 1.2 = $43.2.

11. State two ways to prevent cross-contamination of food. [4]

Answer: Store raw and cooked food separately with different chopping boards and knives; wash hands and utensils after handling raw food; cover food and keep raw items below ready-to-eat items in the fridge.

12. Compare refrigeration, freezing and curing as preservation methods in terms of their principles. [4]

Answer: Refrigeration (0-4 degrees) slows microbial growth; freezing (below -18 degrees) halts most microbial activity by freezing water; curing uses high salt or sugar to lower water activity and inhibit growth.

Part D - Fibres and Fabric Costing (18 marks)

Show all working and units in calculation questions.

13. One top needs 1.6 m of fabric costing $48 per metre. Calculate the fabric required and the fabric cost for 12 tops. [5]

Answer: Fabric = 1.6 x 12 = 19.2 m; cost = 19.2 x 48 = $921.6.

14. The same fabric comes in a 500 g pack at $24 and a 750 g pack at $33. Calculate the price per 100 g for each and state which is better value. [5]

Answer: 500 g pack: 24 / 500 x 100 = $4.8 per 100 g; 750 g pack: 33 / 750 x 100 = $4.4 per 100 g. The 750 g pack is $0.4 cheaper per 100 g and better value.

15. Compare cotton and polyester in terms of two differences in moisture absorption and durability. [4]

Answer: Cotton absorbs moisture, breathes well and feels comfortable but dries slowly and wrinkles or shrinks; polyester absorbs little, dries fast, is strong, abrasion-resistant and wrinkle-resistant but less breathable.

16. Explain two factors to consider when choosing fabric for sportswear. [4]

Answer: Moisture wicking and breathability to stay dry; stretch and freedom of movement; abrasion resistance, easy washing and quick drying; colour and UV protection.

Part E - Garment Construction and Patterns (16 marks)

Show working in calculation questions; answer the others in full sentences.

17. The net bust measurement is 92 cm with 8 cm ease. Calculate the finished bust measurement. [4]

Answer: Finished measurement = 92 + 8 = 100 cm (seam allowances are added when cutting and are not part of the finished size).

18. Explain two functions of the grain line and the fold line on a pattern. [4]

Answer: The grain line keeps the pattern parallel to the selvedge so the garment does not twist and hangs correctly; the fold line means the piece is cut on the folded fabric, giving symmetry and fewer seams.

19. Compare hand sewing and machine sewing in terms of two differences in speed and strength. [4]

Answer: Machine sewing is fast with even, strong stitches and suits bulk production; hand sewing is slower and strength depends on the stitch, but suits blind hems, buttons and delicate work.

20. Explain two points to check during a fitting. [4]

Answer: Shoulder line and neckline sitting flat; ease and length at bust, waist and hip; armhole and sleeve cap smoothness and freedom of movement.

Part F - Family Resources and Consumer Choice (16 marks)

Show working in calculation questions; answer the others in full sentences.

21. A $800 blender is expected to last 5 years. Using straight-line depreciation, calculate the annual depreciation. [4]

Answer: Annual depreciation = 800 / 5 = $160.

22. A family income is $24,000 per month, with 35% for housing and 20% for food. Calculate both amounts. [4]

Answer: Housing = 24,000 x 35% = $8,400; food = 24,000 x 20% = $4,800; together $13,200, i.e. 55% of income.

23. Explain three factors to compare when buying a household appliance. [4]

Answer: Price and energy efficiency (long-run running cost); whether functions match needs; warranty and repair service; brand reputation and safety certification; space required and water use.

24. Explain two benefits of making a family budget. [4]

Answer: It clarifies how income is allocated and prevents overspending and impulse buying; it sets aside savings for emergencies and long-term goals such as education, healthcare and retirement.
