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**FOOD AND NUTRITION**

**0648/12**

Paper 1 Theory

**October/November 2017**

MARK SCHEME

Maximum Mark: 100

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**Published**

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Question	Answer	Marks
1(a)	<i>substance which combines with fatty acids to form a fat molecule (triglyceride)</i> glycerol / glycerine;	1
1(b)	<i>physical difference between fats and oils</i> fats are usually solid (at room temperature), oils are usually liquid (at room temperature);	1
1(c)	<i>chemical difference between saturated and unsaturated fats</i> in saturated fat all carbon atoms are saturated with hydrogen / cannot accept any more whereas unsaturated fats can accept more hydrogen; <b>OR</b> saturated fat has single (carbon to carbon) bonds whereas unsaturated fat has one or more (carbon to carbon) double bond;	1
1(d)(i)	<i>examples of saturated fat</i> butter; cheese; cocoa butter; coconut oil / milk; cream; dripping; eggs; ghee; lard; meat / meat product; milk; palm oil; suet;	2

Question	Answer	Marks
1(d)(ii)	<p><i>examples of unsaturated fat</i></p> <p>avocado (oil);  fish-liver oil (or named example);  flaxseed (oil);  maize / corn (oil);  nut (oil) (or named);  oily fish (or named example);  olive (oil);  peanut (oil);  rapeseed / canola oil;  safflower (oil);  sesame seed (oil);  soya (oil);  sunflower seeds/oil;</p>	<b>2</b>
1(e)	<p><i>ways the body uses energy</i></p> <p>mechanical energy OR muscle movement / work / examples;  chemical energy OR metabolism / growth / repair / concentration / study / digestion / absorption;  heat energy OR maintain body temperature;  electrical energy OR transmission of nervous impulses / brain function;  basal metabolism OR heartbeat / blood circulation / breathing;</p>	<b>5</b>
1(f)	<p><i>unit used to measure the energy value of fat</i></p> <p>kcal / calories OR kJ / kilojoule;</p>	<b>1</b>
1(g)	<p><i>effect of heat on fat</i></p> <p>melts / becomes liquid;  blue haze / smoke given off OR smoking / flash point;  (ignites and) burns;</p>	<b>2</b>

Question	Answer	Marks
1(h)	<p><i>why strain oil after use</i></p> <p>remove impurities / food particles OR to keep it clean; prevent next food to be fried from having appearance spoiled by leftover food particles; prevent rancidity due to food particles;</p>	2
1(i)(i)	<p><i>substance that emulsifies fats</i></p> <p><u>bile</u>;</p>	1
1(i)(ii)	<p><i>enzyme which breaks down fats</i></p> <p><u>lipase</u>;</p>	1
1(i)(iii)	<p><i>part of the digestive system where most digested food is absorbed</i></p> <p>ileum / small intestine;</p>	1
1(i)(iv)	<p><i>location and function of the lacteal</i></p> <p><i>location:</i> <u>villi</u>; <i>function:</i> absorbs (nutrients) OR transports (nutrients);</p>	2

Question	Answer	Marks
2(a)	<p><i>functions of vitamin A (retinol)</i></p> <p>antioxidant;  formation of mucous membranes;  for healthy skin;  helps vision in dim light / at night;  prevents night blindness / xerophthalmia;  production of visual purple / rhodopsin in retina of eye;  required for growth;  required to keep mucous membranes e.g. throat / digestive / bronchial / excretory tracts moist / free from infection;</p>	<b>2</b>
2(b)	<p><i>food sources of vitamin D (cholecalciferol)</i></p> <p>butter;  cheese;  cream;  eggs;  fish liver oils (or named e.g.);  liver;  margarine;  milk;  oily fish (or named e.g.);  red meat;  yoghurt;</p>	<b>2</b>
2(c)	<p><i>function of vitamin E</i></p> <p>antioxidant;  destroys free radicals;  formation of new blood vessels around damaged areas;  functioning of sex organs / reproduction / fertility;  healthy skin;  helps to prevent cancer;  helps to prevent heart disease;  maintenance of cell membranes / cellular respiration;</p>	<b>1</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(d)	<i>source of vitamin K</i>  bacon; black strap molasses; blueberries; cereals / <u>wholemeal</u> flour / bread; cheese; eggs; fish liver oils; grapes; leafy green vegetables / named example; leeks / spring onions; liver; milk; natto / fermented soy; polyunsaturated oils; red meat; yoghurt;	<b>1</b>

Question	Answer	Marks
3(a)	<p><i>Discuss the need for iron and vitamin B9 (folic acid) during pregnancy. Give <u>two</u> examples of how each of these nutrients could be included in the diet.</i></p> <p><i>iron</i>  blood volume increases / formation new blood cells;  making haemoglobin;  blood cells transport oxygen (to provide energy);  blood supply for baby;  baby has to have store of iron to last until weaning;  growth of the placenta / fetus;  prevention of anaemia;  iron deficiency anaemia during pregnancy can increase the risk of the baby having a low birth weight;</p> <p><i>examples</i>  black treacle / molasses;  bread;  cocoa / (plain) chocolate;  corned beef;  curry powder;  dark green leafy vegetables / named example;  dried fruit / named example;  eggs;  <u>fortified</u> breakfast cereals;  kidney;  pulses / soya bean;  (red) meat / named example;  whole grain cereal;</p>	6

Question	Answer	Marks
3(a)	<p><i>folic acid</i></p> <p>help prevent megaloblastic anaemia in mother;  essential for normal growth of baby / no malformations;  essential for the formation of red blood cells;  required for the release of energy from food / protein;  important for the production of DNA / RNA;  helps development of brain and nervous system;  prevents neural tube defects, e.g. spina bifida / cleft lip / palate;  prevents premature birth / congenital heart disease;</p> <p><i>sources</i></p> <p>asparagus;  bananas;  beans;  cheese;  <u>fortified</u> cereals;  grapefruit;  green leafy vegetables / named vegetable;  milk;  nuts;  okra;  oranges;  potatoes;  pulses;  seeds;  whole wheat / wholegrain cereals;  yeast extract;  yoghurt;</p>	



Question	Answer	Marks
3(b)	<p><i>Suggest <u>three</u> types of food which should be avoided during pregnancy. Give reasons for your suggestions.</i></p> <p>pate (liver / veg) may contain listeria which could harm the baby / cause miscarriage / stillbirth;  <u>soft</u> cheese with white rind / blue cheeses may contain listeria which could harm baby / cause miscarriage / stillbirth;  raw / undercooked / cured meat / fish may cause toxoplasmosis;  <u>unpasteurised</u> milk / cheese / yoghurt / goats cheese may contain listeria which could harm baby / cause miscarriage / stillbirth;  raw or partially cooked eggs to avoid the risk of salmonella;  raw egg dishes / home-made mayonnaise / mousse / ice cream to avoid the risk of salmonella;  liver / liver products / products containing vitamin A / fish liver oils as high levels of vitamin A could reach toxic levels and harm baby;  shark / swordfish / marlin / tuna may contain high levels of mercury which can harm a baby's developing nervous system;  raw shellfish can contain harmful bacteria and viruses that could cause food poisoning;  pre-packaged salads unless re-washed due to listeria;</p>	<b>6</b>

Question	Answer	Marks
4(a)	<p><i>advantages of using a slow cooker</i></p> <p>cooking the meal in a single pot reduces washing up;            food can be left to cook all day / good for working households;            gentle cooking allows flavours to develop;            glass lid allows you to see the progress of your food without losing heat by lifting the lid;            kitchen does not get heated as when using an oven;            little / no attention needed during cooking / can do other things;            little loss of (soluble) nutrients / vitamins;            low-fat method of cooking / less oil required;            low temperature makes it almost impossible to burn food even if cooked too long;            portable;            require the minimum amount of effort;            slow cookers are economical of fuel energy / energy efficient / saves fuel;            tougher, cheaper cuts of meat with connective tissue and lean muscle fibre are suitable for use in slow cooker;</p>	6
4(b)	<p><i>storing and reusing leftovers</i></p> <p>cool as quickly as possible;            place in clean container;            cover food / airtight container / sealed container;            store in the fridge / freezer (or at given temperature);            don't put hot food in the fridge, let it cool first;            leftovers should be kept above raw meat and poultry;            only reheat the meat once;            reheat the food to a temperature of 70 °C / (piping) hot all the way through;            consume food within 2–3 days;            use freezer for longer storage;            thaw thoroughly before use if storing in freezer;</p>	6

Question	Answer	Marks
5(a)	<p><i>why recipe not suitable for a coeliac</i></p> <p>contains wheat OR sensitivity to the protein/gluten in wheat;</p>	1
5(b)	<p><i>reason why strong plain flour is used</i></p> <p>enables CO<sub>2</sub> to be held in small pockets; gives better structure to bread; high gluten/protein content; makes a strong elastic dough;</p>	1
5(c)	<p><i>function of the salt in recipe</i></p> <p>controls the action of yeast; flavours bread; improves the dough; strengthens gluten;</p>	1
5(d)	<p><i>importance of water temperature</i></p> <p>correct temperature needed to activate yeast; too cold and the yeast works more slowly; too hot and the yeast dies;</p>	1
5(e)	<p><i>process by which yeast produces carbon dioxide and alcohol</i></p> <p><u>fermentation</u>;</p>	1
5(f)	<p><i>reasons for kneading in bread making</i></p> <p>breaks down large bubbles of gas for even texture of finished dough; develops protein/gluten in flour / forms elastic dough; distributes yeast which aerates dough and stimulates action of yeast / helps yeast react; stretches during rising to trap carbon dioxide;</p>	2

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
5(g)	<p><i>why the crust turns brown during baking</i></p> <p>Maillard reaction / non-enzymic browning; reaction between carbohydrate and protein; dextrinisation; starch (on the bread surface) broken down into sugar/glucose; caramelisation; by sugar/glucose;</p>	<b>2</b>
5(h)	<p><i>rules for personal hygiene when making bread</i></p> <p>wash/clean hands (in hot, soapy water before touching food / after visiting toilet / touching waste bin);            tie back long hair / wear hair net / wear hat;            keep nails short and clean;            wear (clean) protective clothing;            avoid coughing / sneezing / spitting / smoking over food;            cover cuts with waterproof / blue dressing;            do not wear jewellery;            do not wear nail varnish;            if you are ill with diarrhoea or sickness, do not work with food;            do not lick fingers / touch face/nose;</p>	<b>5</b>
5(i)	<p><i>other types of packaging material with an example of its use</i></p> <p>glass; fruit / beverages / sauces / oil etc.            metal / foil; fruit / meat / fish / crisps etc.            paper (board) / card (board); cakes / flour / sugar / tea etc.</p>	<b>4</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
6(a)	<p><i>points to look for when buying fresh fish</i></p> <p>bright eyes not sunken / prominent;  firm / plump flesh;  plenty of scales firmly attached / bright scales;  stiff tail;  skin moist but not wet;  bright red gills;  pleasant smell / fishy smell / sea smell / suigenis;  closed shells;</p>	<b>3</b>
6(b)(i)	<p><i>examples of oily fish</i></p> <p>herring; mackerel; salmon;</p>	<b>2</b>
6(b)(ii)	<p><i>examples of shell fish</i></p> <p>crabs; lobster; mussels; prawns;</p>	<b>2</b>
6(c)	<p><i>suitable coatings for deep frying</i></p> <p>batter;  (egg and) (seasoned) flour;  (egg and) breadcrumbs;  (egg and) oatmeal;  pastry;</p>	<b>2</b>

Question	Answer	Marks
6(d)	<p><i>safety points when deep frying</i></p> <p>use back burner if possible so less chance of being knocked over;  pan handle turned in to avoid knocking over;  pan should have flat base so it does not wobble;  pan not more than half full to prevent overflowing when food is added;  dry food thoroughly before putting into fat preventing food spitting / splutter;  put food into pan carefully / do not throw food into pan to avoid splashing;  do not overfill pan with food or oil may overflow / leave enough space for food to be turned;  do not overheat oil as this could catch on fire;  have lid / fire blanket / damp cloth nearby to cover pan / prevent oxygen reaching flames if it catches fire;  do not move pan if on fire due to safety hazard for kitchen and chef;  do not leave unattended may ignite / overflow;  turn heat off if oil begins to smoke fat is near flash point;  the pan / equipment / utensils should be dry before using to prevent oil spitting;</p>	4
6(e)	<p><i>ways to make steamed white fish more appetising</i></p> <p>sauces to add colour e.g. parsley sauce;  use of garnish e.g. dill / tomato;  accompaniments e.g. colourful <u>named</u> vegetables;</p>	2

Question	Answer	Marks
7(a)	<p><i>Describe the functions and advantages of each of the following additives (i) preservatives; (ii) flavourings and sweeteners; (iii) emulsifiers and stabilisers.</i></p> <p><i>preservatives [max. 5 marks for this section]</i>  to extend the shelf life of food;  stop the growth of bacteria;  slow down / reduce natural spoilage of food;  increases time food is <u>safe</u> to eat;  to help food keep longer;  improve keeping quality;  use food out of season;  maintain freshness;  food can be transported greater distances;  good for emergencies / unforeseen circumstances;  increases variety / range of processed/pre-prepared foods available;  prevents oxidation / stops browning;  examples: salt, sugar, acid, smoke, sulfur dioxide, antioxidants, nitrates;</p> <p><i>flavourings and sweeteners [max. 5 marks for this section]</i>  used to improve taste;  add flavour;  restore original flavour (after processing);  to reduce sugar content;  to develop a product range e.g. crisps;  to create new food products with unusual flavours;  sweeten a product without adding excessive calories, beneficial as allows consumers sweet taste without extra calories;  can be used in confectionery / bakery goods / many other foods to provide a range of healthy option products;  can help reduce tooth decay;  can reduce the sugar content which can help consumers with weight reduction / obesity;  suitable for diabetics (e.g. jam / jellies) increasing the food choice for diabetic consumers;  economical to use by food manufacturers keeping costs low for consumers;</p>	15

Question	Answer	Marks
7(a)	<p><i>emulsifiers and stabilisers [max. 5 marks for this section]</i></p> <p>help to improve the consistency / texture / mouth feel;  mix together ingredients like oil and water that would normally separate;  lengthen shelf life;  control / prevent crystallisation;  form an emulsion when fat and sugar are mixed together;  improved shelf life means there will be less wastage / products can be stored for a longer period of time;  stabilisers prevent them from separating again / keep them dispersed;  allow fats and oils to mix with water;  gives consumers on a weight reducing diet increased choice;  improves the appearance of low-fat spreads / salad dressings / mayonnaise for consumers;  added to bread dough to enhance volume / reduce staling;  added to chocolate to stop fats separating forming fat crystals called blooming;  added to frozen dessert products e.g. ice cream / mousse / sorbet for a smooth texture and ensure the product does not melt rapidly after serving;  examples: ice cream / sorbet, mousse, low-fat spreads, salad dressings, mayonnaise, gelatin, pectin, chocolate, bread etc.;</p>	



Question	Answer	Marks
7(b)	<p><i>Describe and explain ways to prevent food poisoning when storing and preparing food.</i></p> <p><i>storing [max. 8 marks]</i>  follow manufacturer's storage instructions for suitable place to keep food e.g. remove food from opened can to prevent reaction with lining;  dry food such as rice, flour, canned goods etc. should be stored in cool, dry, clean, ventilated area to prevent mould / to keep in good condition;  keep dried foods / biscuits in airtight containers to prevent them getting damp to avoid mould / vermin / pests / dust;  store food on shelves / off floor to minimise the risk of pests / contamination;  dispose of dented / rusting / burst cans to prevent contamination from bacteria;  high risk and perishable foods in fridges to slow growth of microorganisms;  clean storage areas regularly / use antibacterial cleaners / clean and defrost fridges / freezers regularly to maintain hygiene standards;  put chilled / frozen foods away immediately after shopping to minimise microbial growth;  do not mix old food and new food to prevent contamination;  do not use any food past its 'use-by' date / check dates on perishable foods regularly / rotate stock to ensure food is fresh / consumed within use-by date;  keep foods wrapped / covered to protect from flies / vermin;  keep raw meat (and poultry) away from other foods / put raw meat at the bottom of the refrigerator, cooked meat above it to prevent cross contamination;  do not overload refrigerator / allow air to circulate to ensure fridge at optimum temperature;  allow cooked food to cool before placing in the fridge to ensure fridge doesn't heat up;  check fridge temperature regularly / should be 1–4 °C / have an alarm to ensure at optimum temperature / minimises growth of microorganisms;  minimise number of times fridge / freezer are opened to maintain temperature / prevent entry insects;  keep freezer at –18 °C to keep microorganisms dormant / enzymes inactive;</p>	15

Question	Answer	Marks
7(b)	<p><i>preparing [max. 8 marks]</i></p> <p>keep raw and cooked foods apart to prevent cross-contamination;  ensure vegetables / fruits are washed before use to remove of soil / fertiliser / to prevent contamination;  wash chopping boards, knives and other equipment and hands, after use with raw food to prevent cross-contamination;  keep pets / pests / insects away from food preparation to prevent infestation;  ensure thorough cleaning of food preparation area before / after use to prevent cross-contamination;  dispose of rubbish in covered bins / empty frequently to prevent mosquitoes / to discourage pests / flies / vermin;  extra care with high risk foods to prevent contamination;  wipe up spills immediately to discourage pests / flies / vermin;  sterilise / clean dishcloth and tea towel to prevent spread of bacteria;  use separate colour coded chopping boards / knives / equipment for each category of food to prevent cross-contamination;  do not use chipped or damaged equipment which can harbour bacteria;</p> <p><i>personal hygiene – max 3 marks from preparing section:</i></p> <p>handle food as little as possible to prevent cross-contamination;  clean hands in hot, soapy water before touching food / after visiting toilet / after touching raw meat / blowing nose / touching waste bin to prevent spread of bacteria;  tie back long hair / use net as bacteria on hair / may fall into food;  keep nails short and clean as harbour dirt / bacteria etc.;  wear clean protective clothing to prevent contamination from outdoor clothing;  avoid coughing / sneezing / spitting / smoking over food to avoid transferring bacteria;  cover cuts with waterproof/blue dressing to avoid transferring bacteria;  avoid wearing jewellery which could trap dirt / bacteria;  do not prepare food if you are ill with diarrhoea / sickness to avoid passing on infection;  do not lick fingers / touch face / nose or bacteria will pass to food;  do not lick spoons and put back into food as bacteria in nose and throat will be transferred to food;</p>	