**Mock Exam Revision Checklist**

**Chapter 7 - Exchange Surfaces and Breathing**

* **Need for exchange surfaces** (metabolic activity, diffusion)
* **Calculating SA:Volume**
* **Features of a specialised exchange surface** (ventilation, concentration gradient, Surface area, blood supply)
* **Structure of respiratory system**
* **Structure of trachea** (cartilage, goblet cells, mucus, ciliated epithelium)
* **Structure of bronchi** (cartilage)
* **Structure of bronchioles** (smooth muscle, squamous epithelium, asthma)
* **Key features of alveoli** (elastic recoil, surfactant surface area, thin layers, blood supply, ventilation)
* **Mechanics of inspiration** (thorax, diaphragm, intercostal muscles, pleural membrane, pressure)
* **Mechanics of expiration** (exhalation, passive)
* **Ways to measure lung capacity** (peak flow, vitalograph, spirometer)
* **Spirometer trace** (tidal volume, vital capacity, inspiratory reserve volume, expiratory reserve volume, Residual volume, total lung capacity, breathing rate, patient considerations)
* **Gas exchange in insects** (exoskeleton, spiracles, sphincters, tracheae, chitin, tracheal fluid)
* **Gas exchange in fish** (viscous, gill cavity, operculum, lamellae, buccal cavity, filaments, counter current)
* **Water flow over gills**
* **Counter current exchange system**

**Chapter 8 - Transport in Animals**

* **Need for a transport system**
* **Open circulatory system** (haemocoel, haemolymph)
* **Closed circulatory system** (vessels)
* **Single circulatory system**
* **Double circulatory system** (pulmonary, systemic)
* **Structure of arteries** (endothelium, lumen, collagen, elastic, vasoconstriction, vasodilation, oxygenated)
* **Structure of capillaries**
* **Structure of veins** (deoxygenated, backflow, valves, muscle, elastic, collagen, endothelium)
* **Blood functions**
* **Composition of tissue fluid** (plasma, plasma proteins, red blood cells)
* **Formation of tissue fluid** (oncotic pressure, hydrostatic pressure, osmosis)
* **Role of lymph** (lymphocytes, antibodies, lymph nodes, phagocytes)
* **How lymph returns to the blood** (subclavian vein)
* **Structure of haemoglobin** (biconcave, oxyhaemoglobin, haem group, 4 peptide chains)
* **Oxygen dissociation curve** (erythrocyte, conformational change, positive cooperativity, dissociate, associate, affinity, partial pressure, saturation)
* **Foetal haemoglobin** (foetus, placenta)
* **Transporting carbon dioxide** (plasma, carbaminohaemoglobin, hydrogen carbonate ions, carbonic acid, carbonic anhydrase, chloride shift, haemoglobinic acid)
* **Bohr effect** (exercise)
* **Structure of the human heart** (ventricles, atria, vena cava, semi lunar valves, bicuspid and tricuspid valves, coronary arteries, pulmonary vein and artery, aorta, interventricular septum, tendinous cords, pericardial membranes, myocardium)
* **Heart valves**
* **Cardiac cycle** (diastole, systole)
* **Heart sounds** (lub dub)
* **Electrical activity of heart** (SAN, AVN, myogenic, bundle of His, purkyne fibres, excitation, non-conducting tissue)
* **Interpret ECG trace** (P wave, QRS complex, T wave)
* **Abnormal ECG traces x4** (tachycardia, ectopic heartbeat, atrial fibrillation, arrhythmia, bradycardia)
* **Blood pressure** (sphygmomanometer)

**Chapter 9 - Transport In Plants**

* **Need for a transport system**
* **Dicotyledonous plants** (vascular bundles in roots, stem and leaf)
* **Xylem** (water, minerals, dead,)
* **Phloem** (sugars, living, sieve tube elements, sieve plates, companion cells
* **Root hair cells**
* **Water movement pathways** (apoplast, symplast, cell walls, cytoplasm, casparian strip)
* **Root pressure**
* **Active transport in root pressure evidence**
* **Transpiration** (stomata, guard cells, water vapour, gas exchange)
* **Transpiration stream** (mesophyll cells, concentration gradient, evaporate, water potential gradient, adhesion, cohesion, capillary action, transpiration pull, cohesion-tension theory)
* **Evidence for cohesion-tension theory**
* **Factors affecting transpiration** (light, humidity, temperature, air movement, water availability)
* **Translocation** (source, sink, assimilates)
* **Evidence for translocation**
* **Xerophytes** (waxy cuticle, sunken stomata, fewer stomata, reduced leaves, hairy leaves, curled leaves, succulents, leaf loss, root adaptations)
* **Hydrophytes** (no waxy cuticle, open stomata, wide leaves, reduced plant structure, air sacs, small roots, aerenchyma)

**Chapter 10 – Classification & Evolution**

* **Habitat biodiversity**
* **Species biodiversity** (species richness & eveness)
* **Genetic biodiversity**
* **Sampling** (random, opportunistic, stratified, systematic, line transect, belt transect)
* **Sampling animals** (pooter, sweep nets, pitfall traps, tree beating, kick sampling)
* **Sampling plants** (frame & point quadrat, density, frequency, percentage cover)
* **Abiotic factors**
* **Calculating biodiversity** (Simpson’s index of biodiversity)
* **Measuring genetic biodiversity** (mutations, gene flow, selective breeding, captive breeding, natural selection, rare breeds, genetic bottlenecks, founder effect, genetic drift)
* **Factors affecting biodiversity** (deforestation, agriculture, climate change)
* **Reasons for maintaining biodiversity** (aesthetic, economic, ecological)
* **In-situ conservation** (wildlife reserves, marine conservation zones)
* **Ex-situ conservation** (seed banks, botanic gardens, captive breeding)
* **Conservation agreements** (IUCN, Rio convention, countryside stewardship scheme)

**Chapter 11 - Biodiversity**

* **Habitat biodiversity**
* **Species biodiversity** (species richness & eveness)
* **Genetic biodiversity**
* **Sampling** (random, opportunistic, stratified, systematic, line transect, belt transect)
* **Sampling animals** (pooter, sweep nets, pitfall traps, tree beating, kick sampling)
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**Chapter 12 - Communicable Diseases**

* **Bacteria** (shapes, cell walls, gram positive & gram negative bacteria)
* **Viruses** (pathogenic, bacteriophages)
* **Protoctista** (vector)
* **Fungi** (eukaryotic, saprophytes, spores)
* **Pathogens damaging tissues directly**
* **Pathogens creating toxins**
* **Plant diseases** (ring rot, TMV, black sigota, potato blight)
* **Animal diseases** (TB, HIV/AIDs, meningitis, influenza, malaria, ring worm, athletes foot)
* **Direct transmission** (direct contact, inoculation, ingestion)
* **Indirect transmission** (fomites, droplet infection, vectors)
* **Factors affecting disease transmission in animals and plants**
* **Plant defences** (callose, insect repellent, insecticides, antibacterial compounds, antifungal compounds, anti-oomycetes, toxins)
* **Non-specific defences** (skin, lysozymes, mucous membranes, expulsive reflexes)
* **Blood clotting** (clot, thromboplastin, serotonin, epidermal cells, collagen, blood vessels)
* **Inflammatory response** (histamines, cytokines, temperature, oedema, phagocytosis)
* **Phagocytosis** (phagocyte, phagosome, phagolysosome, enzymes, major histocompatibility complex, antigen-presenting cell)
* **Cytokines**
* **Opsonins**
* **Antibodies** (immunoglobulins, heavy & light chains, variable region, constant region, disulphide bridge)
* **Antibody defences** (agglutinins, anti-toxins, antigen-antibody complex, opsonin)
* **Specific immune response** (T-helper cells, T killer cells, T memory cells, T regulator cells, B & T lymphocytes, plasma cells, B effector cells, B memory cells)
* **Cell-mediated immunity**
* **Humoral immunity** (clonal expansion, clonal selection)
* **Autoimmune disease**
* **Immunity** (natural, passive, artificial, active)
* **Vaccine** (epidemic, pandemic, attenuated)
* **Sources of medicines**
* **Pharmacogenetics** (pharmacogenomics, synthetic biology)
* **Antibiotic resistance** (mutations, MRSA)

**Chapter 19 & 20 – Genetics & Patterns Of Inheritance**

* **Mutations** (bases, substitution, insertion, deletion, point, degenerate, codon, frameshift, protein)
* **Mutagens** (ionising radiation, deaminating agents, viruses)
* **Silent mutations** (introns, degenerate)
* **Nonsense mutations** (stop codon)
* **Missense mutations** (protein, silent, beneficial or harmful)
* **Chromosome mutations** (deletion, translocation, inversion)
* **Gene regulation** (genome, on/off, synthesis)
* **Chromatin remodelling** (histones, euchromatin, heterochromatin, RNA polymerase)
* **Histone modification** (positive charge, negative charge, acetylation, methylation)
* **Lac operon** (operon, lacZ, lacY, lacA, structural genes, regulatory gene, repressor protein, operator, RNA polymerase, promoter, Camp, CRP, glucose, lactose)
* **RNA processing** (pre-mRNA, mature mRNA, cap, splicing, introns, exons)
* **Translational control** (mRNA degradation, inhibitory proteins, initiation factors)
* **Protein kinases** (phosphate groups)
* **Post-translational control** (non-protein groups, disulphide bridges, folding, cAMP)
* **Body plans** (Homeobox, homeodomain, hox genes, diploblastic, triploblastic, somites, radial, bilateral and asymmetry)
* **Mitosis & apoptosis**
* **Factors affecting expression of regulatory genes** (stress, drugs, hormones, environment)
* **Variation** (genes, environment, genotype, phenotype, dominant, recessive, homozygous, allele)
* **Continuous variation** (Range, genetic, environmental, polygenes)
* **Discontinuous variation** (discrete, genetic, one gene)
* **Genetic crosses (**F1/F2 generation, codominance, multiple alleles, sex inheritance, sex linkage, haemophilia, carrier, monohybrid, dihybrid, autosomal linkage, recombinant, epistasis)
* **Chi-squared test**
* **Hardy-Weinberg principle** (gene pool, allele frequency
* **Factors affecting evolution** (mutation, sexual selection, gene flow, genetic drift, natural selection)
* **Populations** (extinct, density-dependent, density-independent, genetic bottleneck, Founder effect, genetic drift)
* **Evolutionary forces** (normal distribution, stabilising selection, extremes, average, directional selection, disruptive selection)
* **Allopatric speciation** (population, isolation, selection pressures, environment)
* **Sympatric speciation** (habitat, interbreed, hybrid)
* **Reproductive barriers**
* **Artificial selection** (selective breeding, inbreeding, generations, gene pool, diversity)
* **Gene banks**

**Chapter 21– Manipulating Genomes**

* **Genome** (introns, exons, minisatellite, microsatellite, VNTRs)
* **DNA profiling (**PCR, restriction endonucleases, restriction site, hybridisation, probes**)**
* **Polymerase chain reaction (amplify, DNA polymerase, primers, anneal Taq polymerase)**
* **Electrophoresis (**agarose gel, buffer, current, Southern blotting**)**
* **DNA sequencing** (primer, DNA polymerase, nucleotides, terminator base, complimentary, chain-terminating base, fluorescent markers)

**Chapter 23 & 24 – Ecosystems & Populations & Sustainability**

* **Abiotic factors** (oxygen, edaphic, water, temperature, light)
* **Biotic factors**
* **Trophic levels** (producer, consumer, pyramids of number & biomass)
* **Efficiency at producer level**
* **Efficiency at consumer level**
* **Ecological efficiency**
* **Decomposition** (decomposers, saprotrophs, detritivores)
* **Nitrogen cycle** (denitrification, ammonification, nitrogen fixation, nitrification)
* **Atmospheric nitrogen fluctuation**
* **Succession** (primary, secondary, plagioclimax, sere, deflected succession, climax community, pioneer community, pioneer species, intermediate community, humus)
* **Measuring plant abundance**
* **Measuring animal abundance** (mark-capture-release-recapture)
* **Populations** (slow growth, rapid growth, stable state, immigration, emigration)
* **Interspecific competition**
* **Intraspecific competition**
* **Predator-prey cycles**
* **Conservation**
* **Preservation**
* **Sustainable resources** (small-scale timber production, large-scale timber production, sustainable fishing)
* **Masai Mara management**
* **Terai region of Nepal management**
* **Peat bog management**
* **Galapagos Islands**
* **Antarctica**
* **Snowdonia National Park**
* **Lake District**