APPRENTI DU VIN

# WSET Level 3 Award in Wines

Paper 01 — Answer Key & Explanations

## Paper 1: Multiple Choice

**1. B** — Sustainable Winegrowing New Zealand (SWNZ)

*Sustainable Winegrowing New Zealand (SWNZ) is an industry-specific programme that over 98% of New Zealand's vineyard area participates in. It covers environmental management, pest and disease control, water and soil management, and social responsibility. Demeter is a biodynamic certification (not wine-specific). LEED is a building certification. Fair Trade applies across industries but is not wine-specific.*

**2. A** — Burgundy classifies individual vineyard plots (climats) while Bordeaux's 1855 Classification classifies chateaux (estates/brands)

*Burgundy's classification is terroir-based: specific vineyard parcels (climats) are classified as Grand Cru or Premier Cru regardless of who owns or farms them. Bordeaux's 1855 Classification ranks chateaux (estates) rather than specific plots; a classified chateau can buy or sell parcels while retaining its classification. This fundamental difference reflects Burgundy's emphasis on terroir versus Bordeaux's emphasis on brand and estate reputation.*

**3. B** — The Left Bank is dominated by Cabernet Sauvignon on gravel soils, while the Right Bank favours Merlot on clay and limestone

*The Left Bank (Medoc, Graves/Pessac-Leognan) is characterised by deep gravel soils suited to Cabernet Sauvignon, which dominates blends. The Right Bank (Saint-Emilion, Pomerol) has more clay and limestone soils where Merlot and Cabernet Franc thrive. Right Bank estates tend to be smaller (especially in Pomerol), while Left Bank chateaux are often larger and more corporate.*

**4. B** — Butter and cream from malolactic fermentation

*Secondary aromas derive from winemaking processes, primarily fermentation and post-fermentation techniques. Butter and cream (diacetyl) come from malolactic fermentation. Other secondary aromas include bread/biscuit (lees contact), vanilla/toast (oak). Primary aromas come from the grape variety (blackcurrant). Tertiary aromas develop from ageing (leather, tobacco, petrol).*

**5. B** — Used international varieties like Cabernet Sauvignon and were labelled as Vino da Tavola because they did not conform to DOC regulations

*Super Tuscans emerged in the 1970s-80s when innovative producers like Sassicaia (Tenuta San Guido) and Tignanello (Antinori) used international varieties (Cabernet Sauvignon, Merlot) and new French oak, neither of which was permitted under existing DOC regulations. These wines were classified as humble Vino da Tavola despite their premium quality and prices. The Bolgheri DOC and IGT Toscana categories were later created to accommodate them.*

**6. B** — Oak alternatives are significantly cheaper and faster at imparting oak flavour

*Oak alternatives (chips, staves, spirals, powder) cost a fraction of new barrels (which can exceed EUR 800-1000 each) and impart oak flavour more quickly due to higher surface-area-to-volume ratios. However, they do not provide the controlled micro-oxygenation that barrel ageing offers, so wines may lack the complexity and evolution of barrel-aged counterparts. They are widely used for commercial-tier wines.*

**7. B** — Selling wines as futures while still in barrel, typically 18-24 months before bottling

*En primeur (also called 'wine futures') is a system where Bordeaux chateaux sell wine from the most recent vintage while it is still ageing in barrel. Buyers (negociants, then merchants and consumers) pay upfront, typically in spring following the harvest, and receive the wine 12-18 months later when bottled. The system provides chateaux with cash flow and buyers with access to allocated wines, though it carries vintage and market risk.*

**8. B** — Gravel reflects heat, retains warmth, and provides excellent drainage, promoting stress and concentration

*The deep gravel beds of the Haut-Medoc (deposited by the Garonne and its tributaries) provide superb drainage, forcing vine roots deep in search of water. Gravel also absorbs and radiates heat, aiding ripening in this marginal maritime climate. The resulting mild water stress concentrates flavours. The best chateaux (Margaux, Pauillac) sit on the deepest gravel outcrops.*

**9. C** — Pomerol

*Pomerol, on the Right Bank, is dominated by Merlot (typically 80-100% of blends) grown on clay and gravel soils with a distinctive iron-rich subsoil (crasse de fer). Estates are notably small (Chateau Petrus is just 11.5 hectares). Pomerol has no classification system, unlike Saint-Emilion. Pauillac, Saint-Julien, and Margaux are Left Bank communes dominated by Cabernet Sauvignon.*

**10. B** — To act as both an antioxidant and antimicrobial agent

*SO2 serves two critical functions: as an antioxidant (protecting wine from oxidation by reacting with hydrogen peroxide and acetaldehyde) and as an antimicrobial agent (inhibiting unwanted bacteria and wild yeasts). It is added at various stages from crushing to bottling. The molecular (free) form is the most effective antimicrobial agent; its proportion increases at lower pH.*

**11. C** — Good

*Using the BLIC framework: good balance is positive, but moderate (not long) length, moderate (not pronounced) intensity, and limited complexity indicate a wine that is well-made but not exceptional. This profile fits the 'Good' quality level. Outstanding wines would show excellent balance, long length, pronounced intensity, and high complexity. Very good wines would score higher than moderate on most criteria.*

**12. A** — Chablis is made from Chardonnay grown on Kimmeridgian limestone, and Grand Cru vineyards face south-west

*Chablis is 100% Chardonnay grown on Kimmeridgian limestone (ancient marine deposits containing fossilised oyster shells). The seven Grand Crus are all located on a single south-west facing slope on the right bank of the Serein river, maximising sun exposure in this cool, continental climate. Most Chablis producers favour stainless steel or old oak to preserve the wine's characteristic flinty minerality.*

**13. B** — Minimum 80% Sangiovese, with up to 20% other approved red varieties (including Cabernet Sauvignon and Merlot); white grapes are no longer permitted

*Chianti Classico DOCG requires a minimum of 80% Sangiovese. Up to 20% may be other approved red varieties, including indigenous grapes (Canaiolo, Colorino) and international varieties (Cabernet Sauvignon, Merlot). The mandatory inclusion of white grapes (Trebbiano, Malvasia) was removed in 2006. The Gran Selezione tier, introduced in 2014, represents the top level.*

**14. B** — Alcohol, sugar, extract, and glycerol

*Body is the perception of weight and fullness on the palate. It is primarily influenced by alcohol level (higher alcohol = fuller body), residual sugar (adds weight), dry extract (dissolved solids from skins, seeds, and lees), and glycerol (a by-product of fermentation that adds viscosity). Tannin contributes to structure but not body per se. Acidity contributes to freshness rather than weight.*

**15. C** — Syrah (with up to 20% Viognier permitted as a co-fermentation)

*Cote-Rotie in the Northern Rhone produces red wines from Syrah, with the unique permission to co-ferment up to 20% Viognier (a white variety). The Viognier is not blended in later but fermented together with the Syrah. In practice, most producers use 0-5% Viognier. The co-fermentation is said to stabilise colour and add aromatic complexity. Grenache is the dominant variety in the Southern Rhone.*

**16. B** — Sustainability programmes typically address environmental, social, and economic factors, going beyond just chemical inputs

*Sustainable viticulture programmes (e.g., Haute Valeur Environnementale in France, Sustainable Winegrowing New Zealand) take a holistic approach encompassing environmental protection, social responsibility, and economic viability. They differ from organic certification (which focuses on chemical inputs) and biodynamic certification (which includes specific preparations). Copper sprays are permitted under most organic and sustainable schemes within limits.*

**17. B** — A sharp, pungent aroma reminiscent of a struck match or burnt rubber

*Excessive free SO2 produces a sharp, pungent, acrid sensation on the nose, often described as a struck match or chemical/burnt rubber character. It can also cause a tingling or burning sensation in the nasal passages. Sensitive individuals may detect SO2 at lower thresholds. Vinegar aromas indicate volatile acidity (acetic acid), not SO2.*

**18. B** — By shifting optimal growing conditions away from historically classified sites, potentially making traditional varieties and styles unviable in their current locations

*Climate change threatens the fundamental premise of appellation systems: that specific sites produce distinctive wines due to their unique terroir. Rising temperatures may make traditional varieties unviable (e.g., Pinot Noir in parts of Burgundy becoming too warm) or shift optimal conditions to previously marginal areas (e.g., southern England). This challenges classifications based on historical quality and raises questions about permitted varieties and stylistic expectations.*

**19. B** — The site is drought-prone and needs a rootstock with deep root penetration

*110 Richter (110R) is a Vitis berlandieri x Vitis rupestris cross known for its vigour, deep root system, and excellent drought tolerance. It is widely used in warm, dry regions such as southern France, Spain, and parts of Australia. For high-limestone soils, rootstocks like 41B or Fercal would be preferred. SO4 or 5BB are common choices for high-vigour, fertile sites.*

**20. C** — Short maceration (skin contact) method

*The short maceration (or limited skin contact) method involves crushing black grapes and allowing the juice to remain in contact with the skins for a few hours to extract the desired colour and flavour before pressing. Saignee ('bleeding') draws off a portion of juice from a red wine tank early in fermentation. Direct pressing presses black grapes immediately with minimal skin contact. Blending (mixing red and white) is generally prohibited in the EU except for Champagne.*

**21. B** — Grafting Vitis vinifera onto American rootstocks remains the primary defence

*Phylloxera (Daktulosphaira vitifoliae) is a root-feeding louse that destroys Vitis vinifera roots. The solution, developed in the late 1800s, was grafting vinifera scions onto resistant American rootstocks (e.g. Vitis riparia, Vitis rupestris). Sandy soils actually resist phylloxera because the louse cannot move easily through them. Chile remains largely phylloxera-free due to geographic isolation.*

**22. B** — Warm, humid conditions with rainfall during the growing season

*Downy mildew requires warm temperatures (above 11 degrees C) and moisture (at least 10mm of rainfall) to release its zoospores. Humid, wet growing seasons create ideal conditions for infection. It attacks all green parts of the vine. Copper-based sprays (Bordeaux mixture) remain the primary treatment, even in organic viticulture.*

**23. C** — Italy, France, and Spain are consistently the three largest wine-producing countries by volume

*Italy, France, and Spain dominate global wine production, typically accounting for approximately 50% of world output. Their relative ranking shifts between vintages depending on weather conditions. The USA is the largest wine market by value and consumption. China's wine market growth has slowed considerably since 2018. France exports more wine by value than any other country, though bulk exports from Spain and Italy are substantial.*

**24. C** — Rioja Oriental

*Rioja Oriental (renamed from Rioja Baja in 2018) is the warmest and driest sub-zone, lying to the south-east and most influenced by the Mediterranean climate. It produces fuller, more alcoholic wines, often from Garnacha. Rioja Alta and Rioja Alavesa have stronger Atlantic influence, producing more elegant, Tempranillo-dominated wines with higher acidity.*

**25. B** — Can develop in dry conditions and does not require rainfall

*Oidium (Erysiphe necator) thrives in warm, dry conditions with moderate humidity. Unlike downy mildew, it does not require free water on leaf surfaces to germinate. It appears as a grey-white powdery coating on leaves, shoots, and berries. Sulphur-based sprays are the traditional treatment. Severe infections cause berry splitting and off-flavours.*

**26. B** — Serving the wine at 8-10 degrees Celsius

*Serving red wine too cold (below 14 degrees C) accentuates tannin perception, making the wine taste more austere and astringent. It also suppresses fruit aromas. The ideal serving temperature for full-bodied reds is 16-18 degrees C. Decanting softens tannins through aeration, and large-bowled glasses promote aroma release. Overly warm temperatures (above 20 degrees C) emphasise alcohol.*

**27. B** — Whether the wine shows primarily youthful, developing, or fully developed/aged aromatic characteristics

*Development on the nose assesses the evolutionary stage of the wine's aromatic profile: youthful (primary fruit-driven), developing (a mix of primary and emerging secondary/tertiary characters), or fully developed/aged (tertiary aromas dominate). This assessment helps determine the wine's maturity and drinking window, and is a key element of the SAT conclusions.*

**28. B** — It introduces stem tannins that can add structure, herbal complexity, and aromatic lift

*Whole-cluster (or whole-bunch) fermentation includes grape stems in the fermentation vessel. The stems contribute additional tannin structure, herbal and spicy aromatic complexity, and can provide a framework for ageing. However, stems must be ripe (lignified) to avoid green, astringent characters. The technique is traditional in Burgundy and increasingly used in premium Pinot Noir worldwide.*

**29. B** — Increasing consumer demand for transparency, sustainability, and perceived health benefits

*The growth of organic wine production (global organic vineyard area has more than tripled since 2005) is driven primarily by consumer demand for sustainable, transparent, and health-conscious products. Millennials and Gen Z consumers are particularly receptive. Organic farming typically produces lower yields and higher costs, which are offset by premium pricing. There is no EU mandate for universal organic certification.*

**30. C** — Winemaker's choice of yeast strain

*Terroir refers to the complete natural environment in which a wine is produced, including climate (macro, meso, and micro), soil, topography (aspect, altitude, slope), and grape variety. While human factors such as yeast selection influence the final wine, they are winemaking decisions rather than components of terroir in its traditional sense.*

**31. B** — To preserve primary fruit aromas and volatile thiols

*Low fermentation temperatures (12-16 degrees C for whites) slow the yeast metabolism, which preserves delicate volatile aroma compounds including the varietal thiols (3-MH and 3-MHA) that give Sauvignon Blanc its distinctive passionfruit, grapefruit, and gooseberry character. Higher temperatures cause these volatile compounds to be lost as they escape with CO2.*

**32. A** — A minimum of 24 months total ageing with at least 6 months in oak for red wines

*Spanish Crianza reds require a minimum of 24 months total ageing, with at least 6 months in oak barrels (in Rioja and Ribera del Duero, this is extended to 12 months in oak). Reserva requires 36 months total (12 in oak), and Gran Reserva requires 60 months total (18 in oak). These ageing classifications are specific to Spanish wine law and are central to the marketing and pricing of Spanish wines.*

**33. A** — The highest level of a three-tier environmental certification scheme for farms, covering biodiversity, phytosanitary strategy, fertiliser management, and water management

*HVE (High Environmental Value) is a French government-backed certification with three levels. Level 3 (the highest) requires meeting thresholds across four areas: biodiversity, phytosanitary strategy (plant protection), fertiliser management, and water management. It has been widely adopted by French wine producers as a practical sustainability framework. It is distinct from organic or biodynamic certification and focuses on measurable environmental outcomes.*

**34. B** — Acetic acid

*Volatile acidity is predominantly acetic acid, produced by Acetobacter bacteria in the presence of oxygen. At low levels, VA can add complexity, but at higher levels it produces vinegar-like, nail polish remover (ethyl acetate) aromas that are considered a fault. All wines contain some VA; it becomes problematic above approximately 0.7-1.2 g/L depending on wine style and jurisdiction.*

**35. A** — Bentonite

*Bentonite is a negatively charged clay that attracts positively charged proteins, removing them from wine (protein stabilisation, especially important in whites). The question describes the opposite mechanism: egg white (albumin), isinglass, and casein are positively charged protein-based fining agents that bind with negatively charged tannins and phenolics, softening red wines. Note: bentonite itself carries a negative charge and attracts positive proteins. Egg white carries a positive charge that attracts negative tannins.*

**36. B** — Higher levels of whisky lactones giving pronounced coconut and dill notes

*American oak contains significantly higher concentrations of whisky lactones (cis- and trans-oak lactone), which impart distinctive coconut and dill characters. It also tends to deliver bolder vanilla and sweet spice. French oak (Quercus petraea/robur) is generally more subtle, with tighter grain, providing fine tannin and spicy/savoury complexity. American oak can be sawn rather than split, making it less expensive.*

**37. B** — 100% Sangiovese (locally known as Brunello)

*Brunello di Montalcino requires 100% Sangiovese (the local clone is called Brunello or Sangiovese Grosso). The wine must age for a minimum of five years from harvest (two in oak) before release; Riserva requires six years. This distinguishes it from Chianti Classico, which permits blending with other varieties. The Montalcino area is warmer and drier than Chianti, producing fuller, more concentrated Sangiovese.*

**38. B** — The duration that flavours persist on the palate after the wine is swallowed or spat

*Length (or finish) measures how long flavour impressions linger on the palate after the wine has been swallowed or expectorated. A long finish (often 10+ seconds for fine wines) is a positive quality indicator. Short finishes (flavours disappear quickly) suggest lower quality. The character of the finish also matters: it should be clean and flavourful, not bitter or harsh.*

**39. B** — Screwcaps eliminate TCA taint risk and provide consistent seal quality, reducing both financial losses and brand damage from faulty bottles

*The economic case for screwcaps centres on eliminating TCA taint (estimated to affect 1-3% of cork-sealed bottles), which represents both direct financial loss and damage to brand reputation. Screwcaps also offer batch-to-batch consistency. Cork industry advocates counter that cork forests are sustainable ecosystems supporting biodiversity, and that cork provides controlled oxygen ingress that benefits ageing. The debate remains active, with regional and stylistic preferences varying.*

**40. B** — Adds body, creaminess, and complexity by releasing mannoproteins and amino acids

*Batonnage stirs settled fine lees (dead yeast cells) back into suspension, promoting the release of mannoproteins and amino acids through autolysis. This adds body, mouthfeel, creaminess, and complexity (bread, biscuit notes) to white wines. It also enhances resistance to oxidation. The technique is classic for barrel-fermented Chardonnay in Burgundy.*

**41. B** — They allow small growers to pool resources for winemaking, marketing, and distribution, achieving economies of scale that individual smallholders could not

*Wine cooperatives aggregate production from many small growers who individually could not afford winemaking equipment, storage, marketing, or distribution. This is particularly important in fragmented regions (e.g., Languedoc, parts of Germany, southern Italy). Cooperatives account for a significant share of production in many countries. Quality ranges widely; some cooperatives produce excellent wine, while others focus on volume. They are not mandated by law.*

**42. B** — To buy grapes, must, or finished wine from growers, then blend, age, bottle, and sell under their own label

*Negociants purchase grapes, juice, or finished wine from multiple growers, then vinify (if necessary), blend, age, bottle, and market wines under their own brand. Major Burgundy negociants include Louis Jadot, Joseph Drouhin, and Bouchard Pere et Fils. Many now also own vineyards. The negociant system provides growers with a reliable sales channel and gives negociants access to a wide range of appellations and climats.*

**43. B** — Barnyard, band-aid, and sweaty saddle

*Brettanomyces is a spoilage yeast that produces 4-ethylphenol (barnyard, horse blanket, sweaty saddle) and 4-ethylguaiacol (smoky, spicy). At low levels, some tasters find it adds complexity (particularly in some traditional Rhone and Barossa wines), but at higher levels it overwhelms fruit character and is considered a fault. It thrives in barrels and is difficult to eradicate.*

**44. B** — Chateau, courtier (broker), and negociant

*Bordeaux's traditional distribution system involves three tiers: the chateau (producer) sells to negociants (merchants) through courtiers (brokers) who act as intermediaries. Courtiers match chateaux with negociants, verify quality, and facilitate transactions for a commission (typically 2%). Negociants then distribute to importers, retailers, and restaurants worldwide. This system dates back centuries and remains central to the en primeur campaign.*

**45. B** — Regional, Village, Premier Cru, Grand Cru

*Burgundy's quality pyramid runs from broadest to most specific: Regional (e.g., Bourgogne Rouge), Village (e.g., Gevrey-Chambertin), Premier Cru (e.g., Gevrey-Chambertin 1er Cru Clos Saint-Jacques), and Grand Cru (e.g., Chambertin). Grand Crus represent the pinnacle, with just 33 sites accounting for about 1.5% of total production.*

**46. D** — Applying additional nitrogen fertiliser to promote early budburst

*Nitrogen fertiliser promotes vegetative growth but does not protect against frost; indeed, promoting early budburst increases frost risk. Wind machines, aspersion (water spraying), and planting on slopes with good air drainage (avoiding frost pockets) are all established frost protection methods. Smudge pots/heaters are another option.*

**47. C** — Mushroom, forest floor, and dried fruit from extended bottle ageing

*Tertiary aromas develop during ageing, both in barrel and bottle. In reds, they include leather, tobacco, earth, mushroom, forest floor, dried fruit, and meat. In whites, they include honey, toast, marmalade, petrol (Riesling), and nuts. Rose petal and grapefruit are primary (grape-derived). Vanilla from oak is secondary (winemaking-derived).*

**48. B** — 225 litres

*The Bordeaux barrique holds 225 litres, while the Burgundy piece holds 228 litres. Larger formats include the demi-muid (600 litres) and foudre (1,000+ litres). Smaller barrels have a higher surface-area-to-volume ratio, resulting in greater oak influence on the wine. The 225-litre barrique is the most widely used size in international winemaking.*

**49. B** — Residual sugar left in the wine, creating a medium for spoilage bacteria

*A stuck fermentation occurs when yeast activity ceases before all sugar has been converted to alcohol. The residual sugar provides a food source for spoilage bacteria (Lactobacillus, Acetobacter) and undesirable yeasts (Brettanomyces), potentially leading to volatile acidity, off-flavours, or re-fermentation in bottle. Common causes include excessive temperatures, nutrient deficiency, or very high sugar levels (osmotic stress).*

**50. B** — Pauillac features deep Quaternary gravel mounds ideal for Cabernet Sauvignon, while Saint-Emilion has diverse soils including limestone plateau, clay slopes, and sandy gravel

*Pauillac, in the Haut-Medoc on the Left Bank, sits on deep gravel mounds (croupes) deposited by the Gironde, perfect for Cabernet Sauvignon's late-ripening needs. Saint-Emilion on the Right Bank has complex soil diversity: the limestone plateau and cotes (slopes) favour Merlot and Cabernet Franc, while the graves sector near Pomerol has more gravel. Pauillac is closer to the ocean than Saint-Emilion.*

## Paper 2: Short Answer

### 51. Compare the major wine classification systems of France, Italy, and Germany. What are the strengths and limitations of each system from a consumer perspective?

*(4 marks)*

**Marking Points:**

- France (AOC/AOP system): terroir-based; regulates geography, varieties, yields, vinification; supplemented by regional classifications (1855 Medoc, Burgundy Grand/Premier Cru, Cru Bourgeois); strength: strong terroir guarantee; limitation: complex, no single national quality hierarchy, does not guarantee individual bottle quality
- Italy (DOC/DOCG/IGT/Vino): similar structure to France; DOCG is highest tier with tasting panel; strength: clear hierarchy; limitation: historically some top wines (Super Tuscans) fell outside the system; IGT became a quality category by accident; complexity of 330+ DOC/DOCG designations
- Germany (Pradikatswein/VDP): Pradikat system classifies by ripeness (Kabinett through TBA); VDP classifies by vineyard quality (Grosse Lage = Grand Cru equivalent); strength: VDP provides terroir hierarchy similar to Burgundy; limitation: two parallel systems cause confusion; Pradikat measures ripeness not quality; dry/sweet distinction unclear to consumers
- General comparison: all systems attempt to guarantee origin and typicity; none perfectly correlates classification with quality in every bottle; consumer understanding varies greatly; New World varietal/brand-driven labelling offers simplicity but less terroir information

**Model Answer:**

*France, Italy, and Germany each employ distinct classification systems with different philosophies. France's AOC/AOP system is terroir-based, regulating geographic origin, permitted varieties, maximum yields, and winemaking practices. It is supplemented by regional classifications: the 1855 Classification ranks Bordeaux chateaux, while Burgundy classifies individual vineyard parcels (Grand Cru, Premier Cru). The system's strength lies in its strong geographic guarantee and centuries of refinement. Its limitations include considerable complexity (over 360 appellations), inconsistency between regional classifications, and the fact that AOC guarantees origin and method but not individual bottle quality. Italy's system mirrors France's structure: Vino (table wine), IGT, DOC, and DOCG in ascending order. DOCG wines must pass a tasting panel. The system's limitation is revealed by the Super Tuscan phenomenon, where some of Italy's finest wines were classified as humble Vino da Tavola because they used non-traditional varieties. The IGT category inadvertently became a premium classification. Over 330 DOC/DOCG designations create significant consumer complexity. Germany operates two parallel systems, creating confusion. The Pradikatswein system classifies by grape ripeness at harvest (Kabinett through Trockenbeerenauslese), measuring sugar content rather than inherent quality. The VDP (private producer association) classification ranks vineyard sites from Gutswein to Grosse Lage, providing a terroir hierarchy analogous to Burgundy. The coexistence of these systems, combined with the challenge of distinguishing sweet from dry wines, makes German wine labelling particularly difficult for consumers. All three systems share a common limitation: classification guarantees typicity and origin but does not guarantee the quality of every individual bottle.*

## 52. Compare the terroir, grape varieties, wine styles, and classification systems of the Cote de Nuits and Cote de Beaune in Burgundy.

*(4 marks)*

**Marking Points:**

- Cote de Nuits: predominantly red wines from Pinot Noir; key villages include Gevrey-Chambertin, Chambolle-Musigny, Vosne-Romanee, Nuits-Saint-Georges; 24 of 33 Burgundy Grand Crus are here; wines tend to be structured, intense, with dark fruit, earth, and significant ageing potential
- Cote de Beaune: both red (Pinot Noir) and white (Chardonnay) wines; key villages include Pommard, Volnay (red), Meursault, Puligny-Montrachet, Chassagne-Montrachet (white); home to the great white Grand Crus (Montrachet, Batard-Montrachet, Corton-Charlemagne); reds are generally softer and more approachable than Cote de Nuits
- Terroir differences: both share the same limestone escarpment but with variations; Cote de Nuits has a narrower strip of mid-slope vineyards with Bajocian/Bathonian limestone; Cote de Beaune has a wider, gentler slope with more varied exposures and Kimmeridgian influence
- Classification system is identical for both: Regional, Village, Premier Cru, Grand Cru hierarchy based on individual climat quality; the system classifies land, not producers; same vineyard may have multiple owners (morcellement)

**Model Answer:**

*The Cote de Nuits and Cote de Beaune form the Cote d'Or, Burgundy's golden slope. The Cote de Nuits, running from Marsannay south to Corgoloin, is predominantly a red wine zone. Pinot Noir thrives in villages like Gevrey-Chambertin, Chambolle-Musigny, Vosne-Romanee, and Nuits-Saint-Georges. Twenty-four of Burgundy's 33 Grand Crus are located here, including legendary sites such as Chambertin, Musigny, Romanee-Conti, and Clos de Vougeot. Wines tend to be structured, deeply flavoured, with dark fruit, earthy complexity, and exceptional ageing potential. The vineyard strip is narrow, with the best sites on mid-slope positions. The Cote de Beaune extends from Ladoix-Serrigny south to Maranges and produces both outstanding reds and whites. Red wine villages include Pommard (structured, firm) and Volnay (elegant, perfumed). The great white wine villages -- Meursault, Puligny-Montrachet, and Chassagne-Montrachet -- produce some of the world's finest Chardonnay. Grand Crus here include Le Montrachet, Corton-Charlemagne, and Corton. The slope is generally wider with more diverse exposures. Both sub-regions share the same four-tier classification (Regional, Village, Premier Cru, Grand Cru) based on individual climats. This terroir-based system classifies the land itself, meaning the same vineyard can have multiple owners producing wines of varying quality from the same classified site.*

## 53. Compare and contrast the effects of cool and warm climates on grape ripening, wine style, and the viticultural challenges each presents. Give specific examples of regions.

*(4 marks)*

**Marking Points:**

- Cool climates (e.g., Chablis, Mosel, Champagne): longer growing season, higher retained acidity, lower potential alcohol, lighter body; viticultural challenges include frost risk, insufficient ripening, and fungal disease pressure from humidity
- Warm climates (e.g., Barossa Valley, Napa Valley, southern Rhone): shorter ripening period, higher sugar accumulation, lower acidity, fuller body and higher alcohol; challenges include excessive heat stress, sunburn, water scarcity, and potential loss of aromatic complexity
- Diurnal temperature variation is critical in both: cool nights in warm climates (e.g., high-altitude Mendoza) preserve acidity; warm days in cool climates are needed for adequate ripening
- Climate change is blurring these categories, with traditionally cool regions (Burgundy, Champagne) experiencing warmer vintages and warm regions exploring higher altitudes and cooler sites

**Model Answer:**

*Cool climates such as Chablis, the Mosel, and Champagne have longer growing seasons where grapes struggle to achieve full ripeness. Wines retain high acidity and tend toward lighter body with lower alcohol. Viticultural challenges include spring frost, insufficient ripening in poor vintages, and fungal diseases (downy mildew, botrytis) due to cool, humid conditions. Warm climates like the Barossa Valley, Napa Valley, and the southern Rhone produce grapes that ripen quickly with high sugar levels, yielding fuller-bodied wines with higher alcohol but lower natural acidity. Challenges include heat stress, sunburn, water scarcity requiring irrigation, and potential loss of varietal aromatics. In both climate types, diurnal temperature variation plays a crucial role: in warm regions like high-altitude Mendoza, cool nights preserve acidity and aromatic freshness. Climate change is increasingly affecting both categories, with cool-climate regions experiencing warmer conditions and warm-climate producers seeking higher altitudes or cooler exposures.*

**54. Explain the concept of terroir and discuss the relative importance of its components (climate, soil, topography, and human factors) in determining wine quality and character. Use a specific region as a case study.**

*(4 marks)*

**Marking Points:**

- Definition of terroir: the complete natural environment in which a wine is produced, encompassing climate, soil, topography, and (debatably) human factors; the concept that a wine expresses its place of origin
- Climate (macro, meso, micro): determines which varieties can ripen, influences acidity/sugar balance, growing season length; e.g., Burgundy's continental climate with vintage variation
- Soil and subsoil: drainage, water-holding capacity, nutrient availability, heat retention; e.g., Burgundy's Kimmeridgian limestone contributing minerality and finesse
- Topography (aspect, altitude, slope) and human factors: south/south-east facing slopes maximise sun exposure; altitude affects temperature; human choices (variety selection, pruning, vinification) interpret terroir; e.g., Burgundy's climat system recognising site-specific expression

**Model Answer:**

*Terroir encompasses the complete natural environment affecting a wine: climate, soil, topography, and arguably human factors. Using Burgundy as a case study: the region's continental climate provides warm summers and cold winters with significant vintage variation. The relatively northerly latitude means grapes (primarily Pinot Noir and Chardonnay) achieve ripeness at the margins, making site selection critical. Soil and subsoil vary dramatically over short distances along the Cote d'Or: Kimmeridgian and Bathonian limestone, marl, and clay create distinct vineyard personalities. Grand Cru sites like Chambertin sit on specific geological formations that provide ideal drainage, water retention, and mineral composition. Topography is equally important: mid-slope sites on east/south-east facing hillsides receive optimal morning sun, benefit from cold air drainage (avoiding frost pockets), and have thinner topsoil exposing calcareous bedrock. The climat system, a UNESCO World Heritage designation, formally recognises that small differences in slope, exposure, and soil within the same commune produce measurably different wines. Human factors -- varietal selection, pruning philosophy, vinification approach -- interpret rather than create terroir, but their role in expressing site-specific character is significant.*