

ANSWER KEYS

ANSWER KEYS TO REASONING IN HUMANITIES AND SOCIAL SCIENCES

1	C	11	C	21	A	31	A
2	A	12	D	22	D	32	A
3	C	13	B	23	B	33	D
4	C	14	A	24	D	34	D
5	B	15	C	25	C	35	B
6	A	16	D	26	B	36	A
7	B	17	D	27	D	37	B
8	C	18	B	28	C	38	D
9	B	19	B	29	A	39	B
10	D	20	A	30	D	40	C

EXPLANATIONS TO REASONING IN BIOLOGICAL AND PHYSICAL SCIENCES

1	D	6	D	11	D	16	A	21	A
2	C	7	D	12	B	17	D	22	A
3	A	8	D	13	A	18	A	23	A
4	B	9	C	14	A	19	A	24	B
5	B	10	B	15	C	20	B	25	D

EXPLANATIONS**EXPLANATIONS TO REASONING IN HUMANITIES AND SOCIAL SCIENCES****1 C**

Option C is the correct answer. The illustration suggests that people who do not work also get paid. The setting, clothing and comment suggest that these men represent the upper class. There is no hint that either work for a living, yet they seem well off. They may be paid for doing nothing – as is the section of society being criticised in the newspaper (people on benefits) So this “something for nothing” culture is soon going to end under the labour movement. This culture points at the practice of the rich and senior officials getting paid for no work done.

2 A

Option A is the correct answer. The fantasy of physical violence is one piece of evidence; “Had there been an axe handy.” The idea that his mother is “ten thousand times better in every way” is another. These lines depict James’ resentment for his father as opposed to the admiration for his mother. He detested his father and his discouragings so much that he would even consider killing him. This does not mean he actually would but that he hated his remarks to that extent as someone hates a person enough to want to kill.

3 C

Option C is the correct answer. Refer to lines “Yes of course, if it’s fine tomorrow” to “day’s sail, within touch” and “But it may be fine-I expect it will be fine” to “was knitting, impatiently”. These lines depict Mrs. Ramsay’s nature that made her popular among her kids. Her son admired her because she is careful of the child’s tender emotions and doesn’t say anything to dampen his spirits. She encourages him with her optimism.

4 C

Option C is the correct answer. Refer to lines “Since he belonged, even at the age of six, to that great clan which cannot keep this feeling separate,” to “enterprise in some crisis of public affairs,” and “Had there been an axe handy,” to “James would have seized it.” The first paragraph of the excerpt explains the first part of the answer. The line “enterprise in some crisis of public affairs”, which comes just after his father utters the improbability of the journey, explains the second part of the answer.

5 B

She doesn’t like to see his bubble burst. Refer to lines “Yes Of course” to “she added” and “But it may be fine” to “was knitting, impatiently”. The first and the last line of the excerpt depict Mrs. Ramsay’s optimistic nature that helps in keeping the hopes of her son alive, who was excited about an expedition.

6 A

Option A is the correct answer. Refer to lines “James Ramsay, sitting on the floor” to “fringed with joy”.

7 B

The poet says that he made a decision and took the road “less travelled by”. It was a road which no one took. So the poet went against certain social norms by choosing that road and his decision was an individual decision. Hence B is the correct answer.

8 C

The poet says that he is a lone traveller and there were two roads in the wood. The poet was confused because he wanted to travel through both the roads but he could travel only one road at a time. He was unable to decide which road he should take. Hence C is the correct answer.

9 B

In the lines “Then took the other.... them really about the same” the poet mentions that he took the other road which is less travelled and which leads to the lush and green pathway which was similar to the other road. Hence option B is the correct answer.

10 D

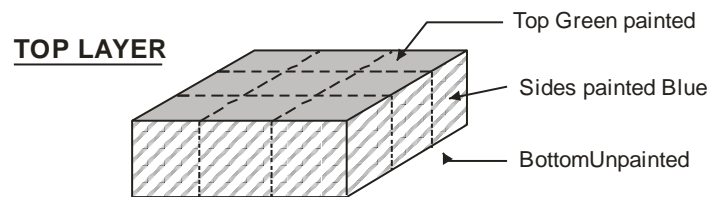
In the last stanza the poet wonders where the road of his choice would lead him. He also wonders whether he would be able to declare later in his life that the road he had chosen had made all the difference in his life. He does not know what the outcome of his decision would be. Hence D is the correct answer.

11 C

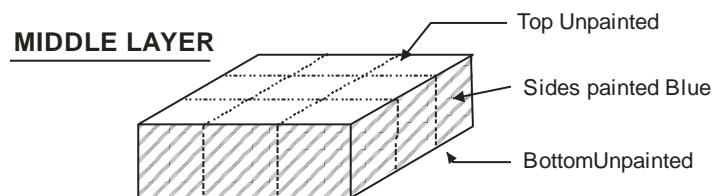
In the entire poem the poet talks about two roads that diverged in a wood and his decision to take the road “less travelled by”. The poet says that he had to choose only one of the roads and he knew not whether “Somewhere ages and ages hence” he would be happily saying to himself that the road he had chosen had made all the difference. Only option C upholds this theme. Hence C is the correct answer.

12 D

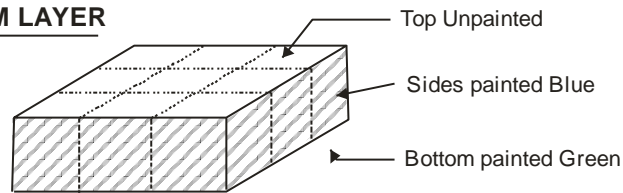
The figure may be analyzed by dividing the cube into three horizontal layers and in all cases 9 cubes have evolved after cutting horizontally and vertically:



In **the top layer**, the central cube has only one face painted green; the four cubes at the corner have three faces painted- one face green and two faces blue. The remaining four cubes have two faces painted – one face green (on top) and one face blue (on the side).

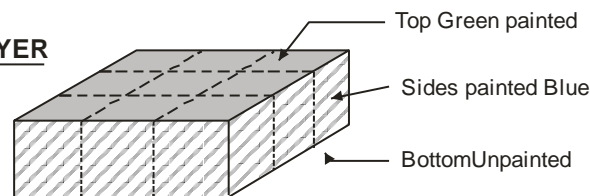


In **the middle layer**, the central cube has no face painted, four cubes at the corners have two faces painted blue and the remaining four cubes have one face painted blue.

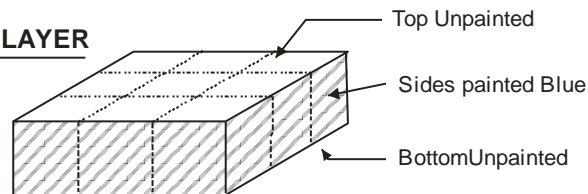
BOTTOM LAYER

In **the bottom layer**, the central cube has one face painted green (i.e, the bottom side) and four cubes at the corners have three faces painted – two blue and one green(the bottom side). The remaining four cubes have two faces painted – one blue and one green. There are four cubes in the middle layer (as shown in the middle layer of the diagram) which have only one face painted in blue. There are no such cubes in any of the upper or bottom layer. So option D is the correct option.

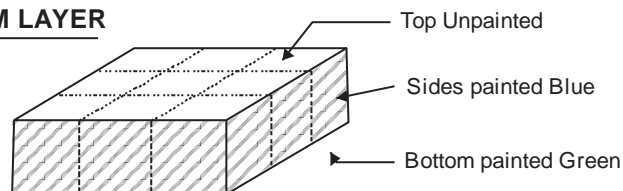
13 B

TOP LAYER

In **the top layer**, the central cube has only one face painted green; the four cubes at the corner have three faces painted- one face green and two faces blue. The remaining four cubes have two faces painted – one face green (on top) and one face blue (on the side).

MIDDLE LAYER

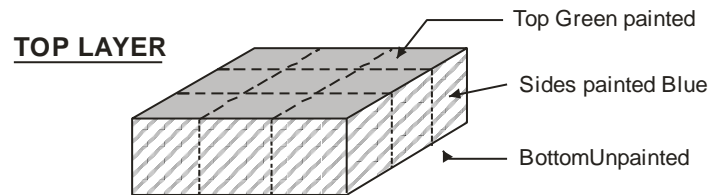
In **the middle layer**, the central cube has no face painted, four cubes at the corners have two faces painted blue and the remaining four cubes have one face painted blue.

BOTTOM LAYER

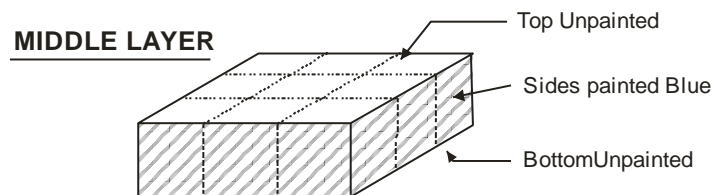
In **the bottom layer**, the central cube has one face painted green (i.e, the bottom side) and four cubes at the corners have three faces painted – two blue and one green(the bottom side). The remaining four cubes have two faces painted – one blue and one green.

Four (corner) cubes in the top layer and four (corner) cubes in the bottom layer have three sides painted. There are no such cubes in the middle layer. Hence, there are 8 such cubes. So option B is the correct answer.

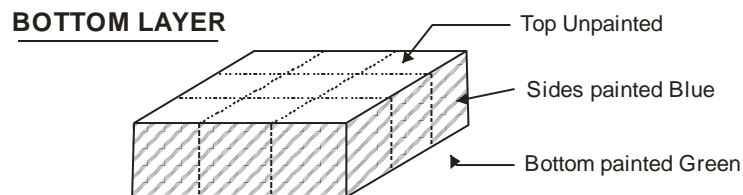
14 A



In **the top layer**, the central cube has only one face painted green; the four cubes at the corner have three faces painted- one face green and two faces blue. The remaining four cubes have two faces painted – one face green (on top) and one face blue (on the side).

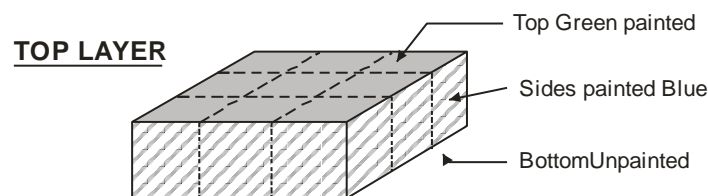


In **the middle layer**, the central cube has no face painted, four cubes at the corners have two faces painted blue and the remaining four cubes have one face painted blue.

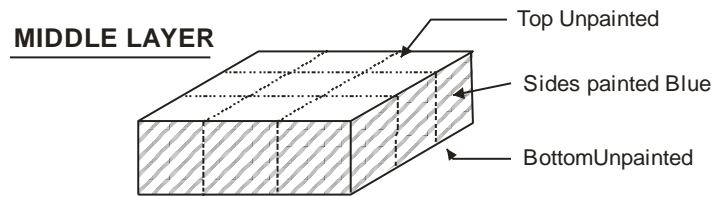


In **the bottom layer**, the central cube has one face painted green (i.e, the bottom side) and four cubes at the corners have three faces painted – two blue and one green(the bottom side). The remaining four cubes have two faces painted – one blue and one green. There is one central cube in the top layer and one central cube in the bottom layer which have one face painted in green. There is no such cube in the middle layer. Only one central cube in the middle layer has no faces painted at all as those faces were not exposed before the cut. So option A is the correct option.

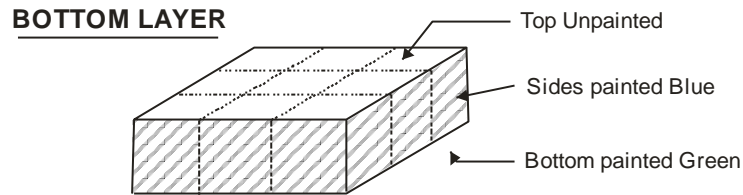
15 C



In **the top layer**, the central cube has only one face painted green; the four cubes at the corner have three faces painted- one face green and two faces blue. The remaining four cubes have two faces painted – one face green (on top) and one face blue (on the side).



In **the middle layer**, the central cube has no face painted, four cubes at the corners have two faces painted blue and the remaining four cubes have one face painted blue.



In **the bottom layer**, the central cube has one face painted green (i.e., the bottom side) and four cubes at the corners have three faces painted – two blue and one green (the bottom side). The remaining four cubes have two faces painted – one blue and one green. There are 9 cubes in each of three layers. Thus there are $(9 \times 3) = 27$ cubes in all irrespective of colours. So the correct option is C.

16 D

Option D is the correct answer. Refer to lines “direct selling (marketing that reaches only the program target) is likely” to “to the marketing program” in passage 1.

17 D

Option D is the correct answer. Refer to lines “There are three groups of consumers” to “to the marketing program” in passage 1.

18 B

Option B is the correct answer. Refer to lines “Such customers, all sharing a particular need” to “to the marketing program” in passage 1.

19 B

Option B is the correct answer. Refer to lines “Second, there is the program target” to “very expensive designer trousers” in passage 1.

20 A

Option A is the correct answer. Refer to the lines “Unfortunately, there are few media” to “so they become annoyed” in passage 2.

21 A

Option A is the correct answer. Throughout passage 2 the answer is discussed. Refer to passage 2 with special reference to “Rarely do members of a particular market segment group” to “only economically feasible mode” and “Inevitably, people get exposed” to “so they become annoyed”.

22 D

Option D is the correct answer. Throughout passage 1 and 2 the answer is discussed. Specially refer to lines “There are three groups of consumers” to “they need or want the product” in passage 1 and “Rarely do members of” to “demographic characteristics”.

23 B

A will be called safer than B if the percentage of fatal cases by A is less than that of B. If we calculate the percentage of fatal cases for the given sources we get:

For FI = $(63 \times 100/116) = 54.31\%$ approx.

For FU = $(18 \times 100/363) = 4.96\%$ approx.

For AU = $(60 \times 100/238) = 25.21\%$ approx.

For K = $(9 \times 100/27) = 33.33\%$ approx.

For AP = $(9 \times 100/72) = 12.5\%$ approx.

For OG = $(3 \times 100/76) = 3.95\%$ approx.

For FP = 0%

For O = $(3 \times 100/22) = 13.63\%$ approx.

For U = $(9 \times 100/51) = 17.64\%$ approx.

Hence, FP is the safest as it does not cause any fatal case. OG must be second as it has lowest percentage of fatal cases. OG must be followed by FU as per the percentage of fatal cases. Hence the correct option is B

24 D

The sample was drawn from non fatal cases. In case of poisoning in FP there were 16 cases. The total number of cases is 981. So the probability that the cause of poisoning is FP is $=16/981=0.02$. So option A is not true. The total number of non fatal cases from Auto Exhaust [AU] is 178. So the probability that the cause of poisoning due to Auto Exhaust [AU] is $=178/981=0.18$. So option B is also not true. The total number of non fatal cases from Unknown sources [U] is 42. Therefore the probability that the cause of poisoning is from unknown sources is $=42/981=0.04$. So option C is also not true. Total number of nonfatal cases in case of appliances [AP] is 63. So the probability that the cause of poisoning is from AP is $=63/981=0.064$. Therefore the probability that the cause of poisoning is from FP or AP is $0.02+0.064=0.08$. So option D is the correct option. Since it is already known that the case is nonfatal, the denominator when calculating probabilities should be the total number of non-fatal cases (ie 807), not the total number of fatal+nonfatal cases (ie 981). This gives the answer B ($178/807=0.22$).

25 C

It can be seen from the cartoon that the father is reading about kids of today in the newspaper, and it is also obvious that he is definitely disapproving of what he is reading. The representation of the child suggests that he is engrossed in useless entertainment and unhealthy food. Option A would be a very literal interpretation of the cartoon; moreover, there is no indication that the father is even aware of what his son is wearing. Option D cannot be concluded from the cartoon as it is too general a statement.

26 B

It is obvious from the cartoon that the man is commenting on what he is reading in the newspaper. However, at the same time, the representation of the kid in the cartoon makes it obvious that he is very much engrossed in television and junk food, but the father does not seem to pay any attention to it. Option A is incorrect as although the disapproval of the father is obvious, it cannot be concluded that he does not take any measure to amend things. Option C is also incorrect as although it can be seen from the cartoon that the father and son are going through different objects of interest, the illustration is not enough to conclude that there is no congruency in the tastes of the two. Option D is also incorrect as it cannot be concluded from the cartoon that children cannot be expected to make the right choices or that the child has not been shown the right direction.

27 D

One of the statements say that television programs are a good way of inculcating intercultural awareness, but it cannot be concluded that television is the best medium for it.

28 C

It can be seen in the cartoon that the kid is engrossed in watching television and eating junk food. It is obvious that the cartoonist has tried to portray these two objects in a negative light; the application of the word 'junk' says that they are totally useless. However, the statements in Comment 2 throw light on the positive aspects of television. Hence, it can be concluded that any product can be either utilised or abused; its effect depends on how it is being used. Option A is incorrect as it is too general a statement and cannot be concluded from the passage. Option B is also incorrect as it has been stated explicitly in the second comment that "TV programs often explore controversial or sensitive issues, which can make it easier for parents and kids to discuss them" and that "Shared viewing gives family members of all ages an opportunity to spend time together", which proves that parents don't always disapprove of every program kids watch. Option D is also incorrect as it is a very general statement and cannot be concluded from the passage.

29 A

From table 2 it can be seen that Lesotho, which is economically much behind Jamaica, has a significantly higher adult literacy rate for females. However it is the only country out of these four, barring Australia, that shows significant gender disparity in literacy rates, a quite notable disparity in primary level of participation rates and very high disparity in secondary level enrolment ratios. So the above analysis makes it clear that under- participation is a major issue for boys in Lesotho; it starts at the primary level and becomes very serious in the secondary levels. Under-participation is also an issue in Samoa at secondary level, while that is not the case for the primary stage of schooling. Jamaica falls under the same category as Samoa, though the level of under-participation is not as high as Samoa even in the secondary stage. Australia does not appear to be experiencing a severe problem of under-participation of boys at any levels of education although compared to females the value is low in the case of males. So option A is correct.

30 D

Racial discrimination can be viewed as a cause of slowing down the growth in development among the countries, but no data for racial discrimination or any indicators giving racial discrimination is provided in the framework. So statement I is false. In case of economic indicators both Jamaica and Samoa belong to the lower-middle income category, and their Human Development Index are also more or less similar. So statement II is true. From table 1 it can be seen that Lesotho is a low income country with HDI (149) from UNDP, 2005. So the statement III is not correct. Statement IV is correct as Australia and Lesotho along with the other countries provide a diverse picture of social features like development indices and economic indices like Per Capita GDP. Australia is on the higher side whereas Lesotho is on the lower side. So option D is the correct option. **Good explanation**

31 A

Option A: GPI in NER [primary level] in Australia is 1.01 and in Samoa it is 0.98 which is more or less similar but GPI in NER [secondary level] in Australia is 1.02 and in Samoa is 1.11. Option B: Literacy rate of Australia cannot be determined from the table. Literacy rate of Samoa (both male and female) is greater than 98% and also has a GPI of 1. So this cannot be concluded for certain. Option C: Per capita GDP in Australia is \$29, 632 AUD and it is one of the high income countries and per capita GDP of Samoa is \$5,854 and it belongs to the lower-middle group of countries. Also the population of the two countries is not known. So the statement cannot be concluded. Option D: Many values of educational indicators in the case of Australia, like the Adult Literacy Rate in case of males and females is not provided. Gender Related Development Index in the case of Samoa is also not given. Again, the income categories of both countries are different. So, overall, we cannot say that whether Australia is close to Samoa as far as economic and educational development is concerned. Therefore, option A is the most appropriate in this case.

32 A

The candidate here needs to take into consideration the Yes points that the passage mentions. It states that “Bad behavior is on a rise in the class room” and “There has been an increase in juvenile crime” It can be inferred from this statement that if corporal punishment is introduced to punish those children who indulge in pranks, crimes and other bullying activities, it is most likely that in years to come such activities will lessen and children will think twice before playing any prank. Option B although is partially correct, but it cannot be marked as the right answer because corporal punishment not only “relates to children being punished at school, but can also refer to children being punished at home”, so the concept of walking safely in the campus is partially correct. Option C is grossly incorrect because nothing as such has been suggested in the passage. As for Option D, although one of the points suggests that the demands put forward by the right groups needs to be impeded, there is no such suggestion that the demands raised by Rights group will gain less importance.

33 D

The candidate needs to take into consideration all the information given above the question. Since the passage above discusses the introduction of corporal punishment in school, irrespective of boys and girls, it can be said that corporal punishment is practiced irrespective of gender. At the same time, taking into consideration the above statement, it can be inferred that caning is not the kind of corporal punishment that is practiced. Therefore, combining the two statements, it can be said that corporal punishments for girls differ from those practiced on boys. Option A can be discarded as incorrect because the passage above does not hint at any kind of gender discrimination in case of practicing corporal punishment. Option B and C are incorrect because nothing as such is suggested in both the statement and the passage.

34 D

The candidate here needs to understand that the question asks for a justification of the act. The supporter of the act will most likely try to show some positive effect of the caning. Option A is incorrect because it does not make clear the positive impact that the caning had on the child. At the same time, the pain inflicted on the student by caning cannot be equated with the pain that other violence inflict. Option B is incorrect because it does not provide any kind of justification for the act. In the absence of any data that supports caning as the most effective way of regulating naughty students, Option C stands only as a statement and not as a justification. Option D is the correct answer because through this statement the supporter justifies the caning and also hints at the positive impact of the caning on the child’s career.

35 B

It can be seen from the two comments that education is entirely different from what is taught in schools. Both the statements emphasise that true and useful education cannot be taught in schools, but is acquired through real-life experience. Option A is incorrect because the two quotes state that real education comes through experience but do not explicitly denounces the teaching in formal schools. Options C and D also cannot be supported from the two statements mentioned in the question. The quotes do not dwell on the negative impact of a formal education.

36 A

The phrase “brick in the wall” is suggestive of commonness among the students, with nothing to distinguish one from the other. The rest of the options do not make any reference to pupils, but allude only to the schooling system.

37 B

“Thought control” is the only phrase that can be referred to as a method implemented by the education system. Option A is incorrect as it refers to the end result of the methods implemented by the education system. Options C and D also cannot be classified as educational methods.

38 D

It is quite obvious that the song is referring to an education system that turns students into mindless creatures who are completely alike. This idea is duplicated in the statement of Option D. The other options cannot be inferred from the song, although would be appropriate to the idea.

39 B

The song and the quotes all talk about how education is used as a means to create identical individuals who do not differ from each other in any respect. In other words, the song and the quotes condemn mindless imparting of knowledge without really imparting wisdom or practical knowledge. The statement in option B seems to be advocating just the opposite that education is, actually, meant to make people wise instead of just filling them up with useless nuggets of information. Option A is incorrect as neither the song nor the comments refer to what education should consist of. Options C and D are also incorrect as they do not reflect the idea exactly opposite to what has been elucidated in the poem and the comments.

40 C

Each insect can move either towards Pheromone or towards Control. Hence, each insect has two ways of moving.

So, total number of ways the five insects can travel is $2 \times 2 \times 2 \times 2 \times 2 = 2^5 = 32$. So the correct option is C.

EXPLANATIONS TO REASONING IN BIOLOGICAL AND PHYSICAL SCIENCES**1 D**

If the antibiotic is the inhibitor of initiation, and it is added at the start of assay, the protein will not be formed, and almost no *cpm* will be observed (graph IV). However, if this antibiotic is added at some later stage, a portion of the protein that had previously formed will produce *cpm*. However, due to inhibition of initiation step, no more additional protein will be produced. This process would result in graph II. If elongation or termination would have been blocked by the antibiotic, some of the *cpm* would have been observed with the addition of the antibiotic at the start of experiment. Additionally, if transcription had not been done properly, *cpm* would not have been observed by the addition of the antibiotic at the start, nor by its addition at the later stages.

2 C

Stop codon causes the termination of protein synthesis. If this codon has been mutated, it would impair the process of termination. The translation machinery will continue translating the codons adjacent to this mutated stop codon. This process would result in a protein longer than a normal protein. As it has been described in the question of 'counts per minute (cpm) results from the incorporation of radiolabelled amino acids', longer protein will have more radiolabelled amino acids incorporated in it and will give high cpm. These results are clearly visible in graph III.

3 A

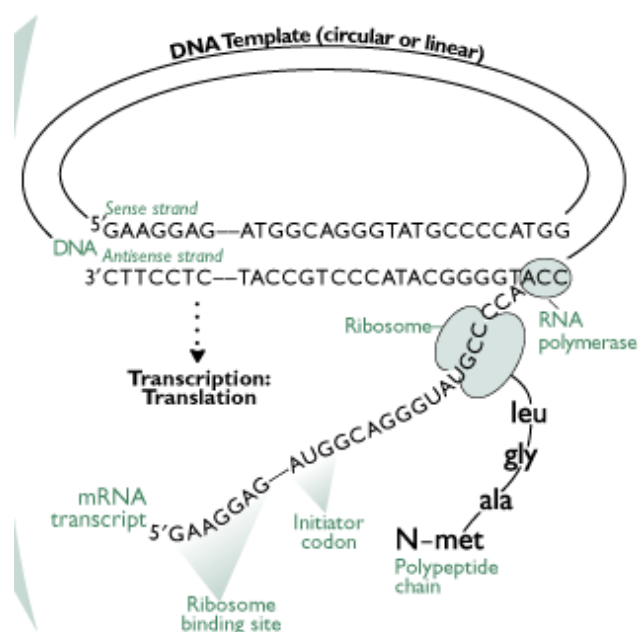
The antibiotic may cause the cleavage of the protein that is produced. In this process, the cpm will not be affected. The amino acids have been incorporated, and the cleaved peptides will be precipitated by TCA. Therefore, TCA precipitation would remain the same for both, with and without antibiotic. If B were correct, graph II would have been achieved due to inhibition of the elongation process. C is also incorrect, because with in vitro translation, only that gene sequence is translated which we want to get translated. D is also incorrect, because even if antibiotic is inhibited for a short period of time, graph II would have been achieved.

4 B

The immature red cells do not have the nuclei. However, they contain a lot of mRNA. This endogenous mRNA may cause a background in the assay. Ca²⁺-dependent nuclease removes the endogenous mRNA. This nuclease can later be inactivated by chelation of the Ca²⁺ using EGTA. Furthermore, the exogenous mRNA is added, and the translated protein is mainly the protein that was required to be assayed.

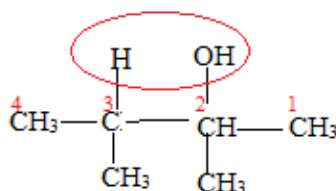
5 B

Antisense strand is the template stand. The provided 5'-3' sequence has to be converted into 3'-5'. By making its complementary sequence, 5'-3', the sequence of sense strand will be obtained. This is the exact sequence that will be obtained in primary RNA transcript. The following figure assures a complete understanding.



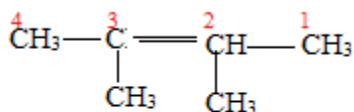
6 D

Dehydration is defined as the removal or elimination of water. As described in the passage, that elimination of water imparts unsaturation to the compound.



2,3-methyl-2-butanol

When water is eliminated, double bond will be formed as shown below:



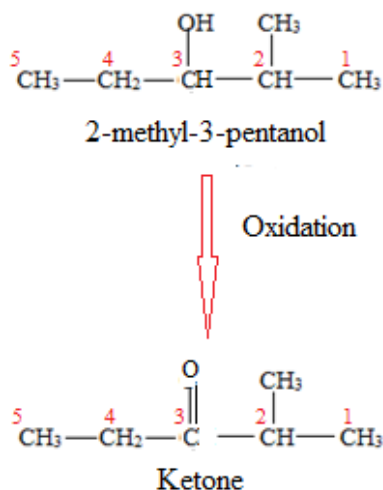
2,3-methyl-2-butanol

This structure can also be represented as follows:

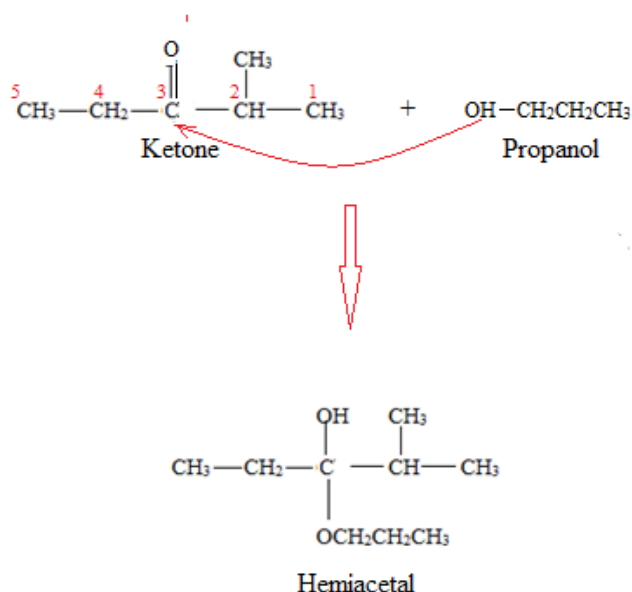


7 D

The passage provides the information of when alcohol is oxidized OH is changed to C=O. This means that the product of oxidation of 2-methyl-3-pentanol is a **ketone**.

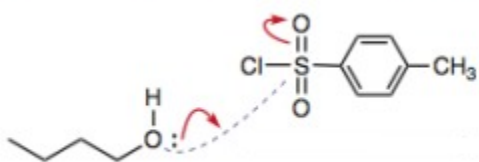


According to the provided information, ketone reacts with alcohol to form hemiacetal. The OH group of alcohol acts as a nucleophile, and attacks the carbonyl carbon of ketone, thereby forming the hemiacetal.



8 D

A is incorrect, because if OH had been a good leaving group, whole OH would have been removed. B is incorrect because Cl is not the electrophilic center in TsCl. S is the electrophilic center. C is also incorrect because in this reaction, O⁻ of OH acts as a nucleophile, and it attacks the S of TsCl as shown in the figure [2] below. Therefore, D is the best option.



9 C

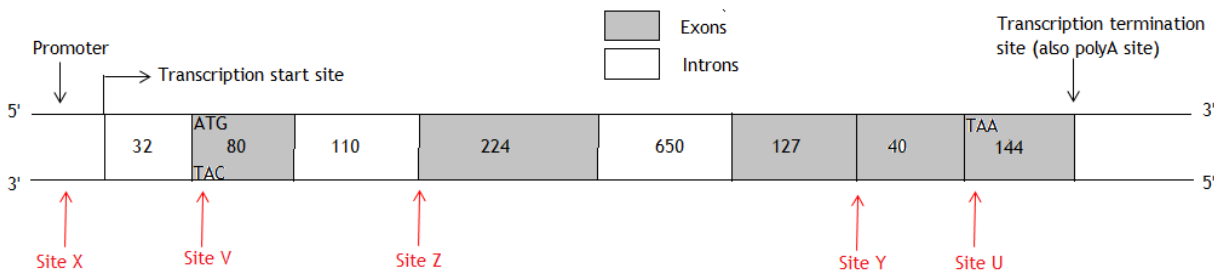
The chemical compound will undergo nucleophilic acyl substitution. As there are only three OH groups, only three methyl groups will be substituted, even after five reactions.

10 B

If the esterification reaction is viewed carefully, it shows that R-O comes from alcohol. By writing the chemical structure of 1-Methylethyl acetate, it becomes evident that the alcohol used for esterification was a secondary alcohol.

11 D

Site V is the site where a start codon for translation is present. Mutation at this site will neither affect the pre-mRNA, nor the mRNA. However, the mature RNA will not be translated into protein due to some mutation in the start codon.



12 B

Site Z is the junction of intron and exon. Mutation at this site may affect the splicing of this intron. If this intron is not spliced normally, length of pre-mRNA will not be affected. However, length of the mature mRNA will increase due to the addition of 110 nucleotides of intron. This may also add some amino acids to the protein.

13 A

Mutation at site Z can affect the splice site, thereby introducing 110 nucleotides of introns into the mRNA. Also, at site U, a mutation at the stop codon may result in failure of transcription termination. Transcription will continue, unless the transcriptase comes across any stop codon in the DNA sequence. Therefore, mutations in both of these may produce a protein longer than the normal.

14 A

Fe³⁺/Fe²⁺; E-FMN / E-FMNH₂ is the correct option. Fe³⁺ is the oxidized form, and Fe²⁺ is the reduced form. Similarly, E-FMN is the oxidized form, while E-FMNH₂ is the reduced form.

15 C

The antibiotic can be named as an uncoupler. The transporter which allows the transport of protons disturbs the proton gradient across the membrane thereby decreasing the ATP synthesis. The consumption of oxygen will be increased as the flow of electrons will not be disturbed, and the energy released in electron transport will be dissipated as heat.

16 A

When NADH will be absent, even the first enzyme complex i.e. NADH dehydrogenase will not be reduced, thereby keeping all the next enzyme complexes of series in oxidized state. Oxygen is present in normal concentration, so it will not affect the process.

17 D

As shown in the figure, complex 5 is the cytochrome oxidase. If this will be inhibited, all the previous enzyme of chain will be successfully reduced. However, due to the inhibition of this enzyme, the final step i.e. formation of water will not be able to take place. Therefore, all of the enzymes in the chain will be in a reduced form.

18 A

Low level of oxygen (hypoxia) will lead to continued ATP synthesis without oxidative phosphorylation. This is caused due to the proton gradient being formed, leading to ATP synthesis. However, there will be no oxygen to combine the H^+ to form water. Dehydration is the condition where cell has low amounts of water. By looking at the figure, it can be assumed that it may increase the oxidative phosphorylation. Normoxia is the normal amount of oxygen, and Hyperoxia is the excess of oxygen. Neither normoxia nor hyperoxia can discontinue oxidative phosphorylation.

19 A

Analysis of the above graphs will show that, patients with altered p53 have the shortest overall survival. After a follow up of 80 months, these patients have an overall survival rate below 60%, while patients with wild-type p53 have an overall survival rate of approximately 90%. Alternatively, people with an altered PI3K have an overall survival rate of approximately 80%.

20 B

In Graph a, Value of 80 months on x axis corresponds to 58% (approximate) on the y-axis.

21 A

Patients with mutated p53 alone have an overall survival (follow up 80 months) of approximately 58%, while patients with concomitant p53 and PI3K mutations have a survival rate of 30% (graph d).

22 A

This question tests the candidates' ability to recognize rate of change in a graph. From simple observation, one can see that a greater pressure change is needed between 2500 and 2750 (approximately 4cm H_2O), compared to the pressure difference required between 2750 and 3000 (approximately 1cm H_2O). Therefore A is the correct answer.

23 A

Static compliance is a measure of the change in volume achieved at a relative change in pressure. This can be inferred from the slope of the graph at a given point. This is commonly expressed as the rise over the run, or in this case, the change in volume divided by the change in pressure. Therefore, A is the correct answer.

24 B

Referring to the graph, at higher volumes, there is a relatively larger change in volume for a relatively small change in pressure. Therefore, using the formula incorporated into the question, we can see that compliance is greatest at increased volumes. Therefore, B is the correct answer.

25 D

From this formula, it is relatively apparent that as surface tension increases, so does the pressure (it is directly proportional). It is also true that as radius decreases, the pressure increases (inversely proportional). Therefore, answer D (A & C) is the correct answer.