

Answer Key XAT 2016

1	E	2	B	3	C	4	D	5	B	6	A	7	D	8	E	9	A	10	C
11	D	12	B	13	A	14	E	15	C	16	E	17	A	18	C	19	A	20	D
21	E	22	B	23	D	24	E	25	B	26	E	27	A	28	E	29	A	30	B
31	D	32	D	33	C	34	E	35	D	36	D	37	B	38	C	39	C	40	E
41	E	42	C	43	D	44	A	45	B	46	B	47	E	48	C	49	A	50	B
51	B	52	B	53	E	54	B	55	D	56	A	57	C	58	B	59	A	60	A
61	D	62	D	63	C	64	E	65	A	66	B	67	C	68	C	69	D	70	C
71	A	72	E	73	B	74		75	A	76	D	77	C	78	E				

Solutions XAT 2016

1. E The statement indicates that outcome gives an indication of input. Except E no other statement focuses on outcome being an indication of input. For example C is wrong as it says that if output is good, input is immaterial.
In A there is no mention of input. There is only a mention of outcome and promotion of the same.
B is wrong as it talks about how two related events occur together.
D talks about how input determines output. So the logic is exactly opposite of the statement.
E talks about how outcome is the ultimate proof of input and is hence the correct answer.
2. B The closest meaning of inspection is to check or examine. Vivisection is surgical operation on live animals for the purpose of research. Hence, the meaning of vivisection can be extended to sharp and detailed analysis.
The relationship between inspect and vivisection is the same as between checking/examining/finding and detailed analysis. One has to check/examine before one conducts a detailed analysis i.e. vivisection. Vivisection shall therefore come after inspection. Inspection is more superficial/less intense than vivisection.
From the options available, to inquire is to seek information and ask a question while to explore is to go further and engage in deeper inquiry/ deeper experience. Therefore option B is the right answer.
In Option C, both investigate and interrogate are nearly similar, though good interrogation (preliminary) leads to good investigation (detailed) and not the other way round. Investigation can also be defined as carrying out a research or study which is deeper than interrogation and which is closer to vivisection than inspect.
3. C A only captures the first part of the poem. B talks only about the path and not about the destination. C is the right answer because it answers the first question i.e. exploring inner space raised in stanza 2 and the futility of external search mentioned in first stanza. D is wrong because heart's pathways are narrow according to the poem. E is wrong as the poem is about "inner journey" and not about "light".
4. D The core argument of the author is that the political texture (politics or the office of the prime minister) and survival of the country are not related.
The country's survival is in "auto pilot mode", according to the author.
Except option D, the others say nothing about this "auto pilot mode"
Option B can be a possible option to strengthen the author's view but it can be only one of the ways the country can be on "auto pilot".
5. B As the last sentence ends with trust, which is a positive word the phrases that follow should also be positive. All options A, C, D, E have 'something negative' that we normally do not associate with trust leaving B to be the right answer.
6. A R is a refutation of something and it can refute Q but not P. Because P is generic and therefore difficult to refute while Q can be refuted easily. Q is an attempt to specify P. R is a statement that refutes Q and not P. Therefore SPQR is the most logical order making A the correct answer.
7. D R raises two questions: The first part is answered by "Q (When is a thing symmetrical?) and the second by S (How can we define it?). Q and S therefore should follow R. P illustrates what is defined in S i.e. something that looks exactly the same after an operation on it. So P after S provides the logical order. Therefore option D is the correct answer.
8. E A is incorrect as no conclusions can be drawn from cricket from the information provided. B is wrong because "popularity" may not imply success, as some of the most popular teams may not be most successful.
C is incorrect since Indian football team and Indian football clubs are different and cannot be compared. D is false as we do not have any data on coaches for Indian national team. E is erroneous because the popularity of a sport in a country need not definitely imply success and therefore may not generate a successful player or for that matter a coach. Therefore the correct answer is Option E.
9. A It is pronounced soo-bri or bruh and the last syllable rhymes with "day" or "pet" and therefore A is the correct answer.
10. C Dishonesty, betrayal, sin, unfairness may not be aggressive behaviours. B is wrong as unfairness, immorality, cheating may not be corrupt and/or "illegal". Similarly knavery, cheating, cutting corners, sin etc. may not be banned. E is wrong as all of them may not be vetoed....hence the right answer is C.
11. D A can be definitely interpreted from the passage since Oinos admits to Agathos that Agathos was talking about "creation". B also can be interpreted (Shortly before the final overthrow of the earth).
C can be definitely interpreted from Oinos' statement.
E (from the last line of the passage) can be interpreted.
Only D cannot be definitely interpreted, since the passage does not suggest that natural laws are the creations of philosophers.
12. B A: It cannot be right as nowhere is it mentioned that marginalised sections are incapable of saving.
B: Statement 2 would make sense only when all sections of society are equally exposed to all opportunities. Else, Statement 2 would be less relevant as giving equal opportunities would be of no use if people are not exposed to equal opportunities. Hence B is the right answer.
C: Statement 2 assumes that everyone should be given equal opportunity but it does not say everyone is equal. This is consistent with "merit" and not against "merit".
D: Statement 2 assumes that only differentiator is the diligence of the citizens.
E: Statement 1 assumes that the marginal sections are laid back and rely on their entitlements.
There is an underlying belief in the statement 2 that contradicts statement 1. The two statements (1 and II) contradict each other especially when talking about "marginalised sections". Statement 1 can hold true if statement 2 is not applicable to the "marginalised sections".

13. A Refer last line of the first paragraph of passage viz. "Today, most academic economists agree that markets, by themselves, do not lead to efficiency; the question is whether government can improve matters."
Option A therefore is the correct answer.
14. E Option A can be interpreted as it is clearly mentioned in the last line of the passage.
Option B can be interpreted from the first paragraph of the passage.
Option C can be interpreted from the middle portion of the second paragraph of the passage.
Option D can be interpreted from the first paragraph of the passage (second last line of the first paragraph).
Option E cannot be interpreted since there is no mention in the passage that state intervention and imperfect information can never go hand in hand.
Option E therefore is the correct answer.
15. C First paragraph explains why markets fail. Paragraph II discusses a natural experiment wherein market driven economic theories fail to explain success of Asian economies. Option C is the right answer based on the above rationale. Option A is hence wrong since both the paragraphs are related.
Option B is wrong since Para I does not describe markets in general but market failure in particular.
Option D is factually correct but raising and answering a question cannot be the essence of the passage. Moreover while the first paragraph raises a question "can government improve matters", the second paragraph goes beyond answering the question to discuss the failure of market based economic theories in explaining success of Asian economies. Option E is wrong since para I discusses the failure of an economic theory rather than stating it, and paragraph II does not disprove/prove any theory but shows some support for government intervention.
16. E Here "interchangeable" is used in the context of listeners, who can be swapped as per the metaphor.
Complementary is used when two or more entities together complete or improve the picture (for e.g. razor and blade, where both together make a shave), contiguous is used in a 'spatial' sense to denote close entities, conforming means compliant, compatible is closer to complementary and conforming; comparable means "similar"...If something is comparable, it is interchangeable, hence E is the correct answer.
17. A According to the passage the minimum necessary condition for successful communication is the overlap of images between the interlocutors ("Communication between us begins when there is some overlap between two images"). Therefore Option A is the correct answer.
Simultaneous exchange is a result of threshold overlap of shared images. Simultaneous exchange (option B) may not imply communication if there is no overlap of images and without overlap the necessary condition is not met. The same argument applies to Options C, D and E.
18. C In option A both statements record the positives of Ping-Pong as a metaphor.
In option B the first statement is a limitation and the second statement is incorrect.
In option C the first statement is a limitation and the second statement is a limitation of all three metaphors.
In option D, the first statement is correct but the second statement is incorrect as Ping-Pong is interactive.

In option E, both statements are unrelated to Ping-Pong as a metaphor.
Therefore C is the correct answer.

19. A A, I, T
A, A, I
A, A, I
A, I, A
I, A, A
A = Action, I = Interaction and T = Transaction. Hence the best option is A.
20. D A, B, C and E can be known with some errors. i.e., in each of the four options there is an approximation. In option D there is no way somebody can know what he/she doesn't know. This is an impossible situation.
Example: Somebody says "I do not know quantum mechanics."
But he/she cannot say what quantum mechanics is and what in quantum mechanics he/she does not know.
Hence option D is the correct answer.
21. E Option A can be concluded as TRUE.
In Option B, Statements I can be concluded as FALSE.
In Option C, Statement II can be concluded as FALSE.
Option D can be concluded TRUE because we all can be philosophically wrong and experimental physicists are amongst "us".
Option E cannot be concluded as nowhere it is mentioned that theoretical physicist can pinpoint shortcoming of experimental physicists. In other words, this conclusion on Statement II cannot be definitely arrived at.
Hence option E is the correct answer.
22. B Experimental physicists could not have experimented Big Bang as they were not have been present at the time of the event. It could have only been first imagined or deduced. Then only there is a possibility of direct experiments. Hence, MOST LIKELY, big bang theory was proposed by theoretical physicist for the first time. Option D is an irrelevant option as passage never talks about "philosophers". Option E cannot be right answer if we refer to the following in the first Para: "Each piece, or part, of the whole of nature is always merely an approximation to the complete truth, or the complete truth so far as we know it."
Hence option B is the correct answer.
23. D A is wrong as perception helps to capture existence and all existence may not be perceived.
B is wrong since there are entities that exists which may not be perceived.
C is wrong because all that exist can have consciousness.
D is the right answer ("consciousness being the faculty of perceiving that which exists").
E is wrong since "something to be known" and "someone to know" are two presuppositions of knowledge and not of existence.
24. E Law of causality means that change is possible (third para, last line "thing's actions are determined not by chance but by its nature) but only after knowing its nature and hence E is the right answer.
25. B Identification is the process by which one identifies, ie. Identity is perceived.
Option B is correct as perception of Twitter is the process by which one identifies that Twitter exists.
All others are indirect ways of identification with the identity given in the first part of the options.
For e.g. perception of children results in identifying parenthood and not marriage.

Similarly, perception of taxation of citizen results in the identification of taxation and not government.

26. E Option E is the correct answer. This is the law of causality, which states that change can take place only after understanding nature.
27. A He wants to charge more for his competence but with minimum violation of the agreement. So for the agreed services he cannot charge more. But for any new service he can charge more. Hence A is the correct answer.
In B he is in violation of the agreement since the agreement was between people and not the shops.
C and E is wrong since charging more for jumping the queue and extending work hours may increase revenue but will not enable him to showcase his competence (which is his objective).
D is a wrong answer since giving free service is a violation of the agreement.
28. E A, B and C will end in violation of the agreement. C because the price per visit comes down by one third. D does not violate but does not solve the problem of retaining the loyal customers. The correct answer hence is E where the customers get a preference but pay the same.
29. A E and C are wrong as they do not take care of Chatterjee's duty to the city. B is wrong since the locals and not Ghosh are made responsible for the greenery; moreover the 20-30 trees in their respective locality may not be sufficient or even relevant to reduce pollution. D is wrong since Chatterjee is taking the responsibility to buy land from the proceeds of the sale and Ghosh gets the land with no riders (similar to C). A ensures that Ghosh first plants a stipulated number of trees and that too around the factory and the city, hence is the right answer.
30. B Chatterjee may not pursue the green policy unless his future interests are protected.
Option A will not convince Chatterjee as it will not affect his future interests. Moreover, Policy framed in favour of his friend makes it unethical.
Option C is unfounded assumption and hence is wrong.
D may gain Ghosh some sympathy but it is not going to convince Chatterjee.
E may affect Chatterjee, but it might backfire on Ghosh too.
B appeals to Chatterjee's stakeholders and hence is the right answer.
31. D A does not imply any punishment and therefore may not induce the drivers to care about comfort. B may not be taken up by the drivers if they are satisfied with the rents they currently receive and hence is not correct. C focuses on a specific market segment and may not solve the problem for the entire market. E does not ensure that the extra amount will be invested in comfort. D focuses on a measure of comfort and a penalty for lack of comfort based on the measure and hence is the correct answer.
32. D The customers are likely to pay more for comfort and not for safety.
Taxi owners can be motivated to provide more comfort by allowing them to charge more, but only strong penalties would prevent safety violations. Only D addresses both safety and comfort concerns and therefore is the right answer.
Option B and E focus on comfort but ignore safety (violation of traffic rule is only one aspect of safety rule). Moreover, Option E penalizes safety rule breakers by only denying the use of comfort related privilege. Penalty should be more with safety rule violation. Option C does not penalize safety violation. Moreover, the taxi owners may not require a second

loan. Option A is wrong since customers are not willing to pay more for safety.

33. C Fact 1 cannot be the reason as a substantial increase in attrition is irrelevant for the government to take a decision regarding the quality of the scheme. Fact 2 cannot be the reason as one researcher could have died because of other reasons. Fact 3 corroborates the government's reason for not equating publications with rewards (the quality of articles published has decreased). Fact 4 cannot be the reason as 2% decrease is not substantial enough.
Hence the only possible answer is fact 3 making C as right choice.
34. E That most famous researchers are also paid high does not imply that the highest paid researchers are always famous or that they will be productive. If an American Institute is giving extra benefits, it does not mean IIR should also follow it. The researcher may be getting the highest pay as a consequence of receiving the Nobel Prize, or there may be other reasons for the researcher to be highest paid.
Hence E is the correct option.
35. D As given in note 1 of the caselet, the auditor's role is to verify accounts and not to make policies. The Director and other top officials are the best people to decide on policy related matters. As points 1 and 3 are policy related, D is the correct answer.
36. D Option A and Option C are both wrong since in both cases Purushottam is "paying" the police for discharging their duties. Option B is wrong since the pettiness of the bribe cannot be a defence.
Option E is wrong because you don't become right just because others are also doing it. Option D is the best since Purushottam is sending a batch of sweets to many other social institutions and therefore can be argued as a goodwill gesture.
Therefore Option D is the correct answer.
37. B Statement 1 by itself is not a correct answer since "no cause of worry" is not supported by any evidence. This support comes from Statement 4. Therefore Statement 1 together with Statement 4 will convince Ratan. Therefore Option B is the right answer.
38. C Option A is not correct since discount cannot be discontinued just because customers are in the top income bracket. Options B, D and E are not correct since not being present at one event cannot be used against them.
Option C is the right answer since the customers do not seem to be loyal and are also taking advantage of the discount in an unfair manner, since this is a select discount only to the loyal customers.
39. C Action 1 is the third best and better than action 5 in which they get very high ratings for performance in a performance oriented organization.
Action 2 is the second best action since the trio get average ratings instead of less than average ratings for their poor performance.
Action 3 is the worst decision because this action sends mixed signals. Amelia is giving high ratings and simultaneously cutting salary.
Action 4 is the best action because, poor rating reflects the poor performance of the trio in tune with the performance orientation of the organization while giving the trio enough time to improve.
Action 5: The organization is right in giving them an opportunity but rating them high is wrong. This decision is better than action 3 since the communication is clearer and does not

send any mixed signal.

Hence, the correct ranking is 4, 2, 1, 5, 3

Option C is in sync with the above logic and therefore is the correct answer.

40. E Ms Amelia "suspects" that the trio could affect her promotion. She should clear this suspicion by communicating the opinions of the trio to her boss. This will result in her boss reviewing his/her expectations from the trio and therefore also from Ms Amelia. Therefore E is the correct answer.
Options A, B and C do not serve the interests of the organization. While option A and option C might serve Ms Amelia's short term interests.
Option D is wrong since it is her own perception and unfounded.

41. E ABC is a performance focused organization, punishing poor performance and rewarding good. Among the combination of decisions that are appropriate for the given situation, one decision from 1, 2 and 3 and one from 4 and 5 have to be chosen (1, 2 and 3 are about Nicky and 4 and 5 are about Manoj and Benita).
Action 1: Amelia is running away from her responsibility with this action.
Action 2: This decision rewards Nicky for non-performance.
Action 3: Amelia is asking Nicky to focus on performance and gives her an ultimatum. This is a better decision compared to the actions 1 and 2.
Action 4: This decision is wrong because Amelia is punishing Manoj and Benita for their behaviour outside workplace.
Action 5: This decision rewards Manoj and Benita for their performance and is the right thing to do.
Based on this rationale, the best combination would be 3 and 5 therefore Option E is the right answer.

42. C The satisfaction levels of all 6 persons for various real estate projects are shown below (D = dissatisfied, S = satisfied):

Person	M	N	O	P	Q	R	S
Bhatia	D	D	D	D	D	D	D
Patel	S	D	D	D	S	D	S
Khan	S	D	D	D	D	D	D
Singh	D	D	S	D	D	D/S	D
Yadav	D	S	D	D	S	S	S
Lingdo	S	D	D	D	S	D	S

Hence the right option is C

43. D The satisfaction levels of all 6 persons for various real estate projects are shown below (D = Dissatisfied, S = satisfied):

Person	M	N	O	P	Q	R	S
Bhatia	D	D	D	D	D	D	D
Patel	S	D	D	D	S	D	S
Khan	S	D	D	D	D	D	D
Singh	D	D	S	D	D	S/D	D
Yadav	D	S	D	D	S	S	S
Lingdo	S	D	D	D	S	D	S

Based on the previous table, Option D is the correct answer.

44. A The new table is shown below:

Person	M	N	O	P	Q	R	S
Bhatia	D	D	D	D	D	D	D
Patel	S	S	D	D	S	S	S
Khan	S	S	S	S	S	S	D
Singh	D	D	S	D	D	S/D	D
Yadav	D	S	D	D	S	S	S
Lingdo	S	S	S	S	S	S	S

Hence, Option A is the correct answer.

45. B Veracity of leaked report has not yet been ascertained. It may be a good idea to first check the credibility of the report through an independent agency. Based on these findings a concrete action can be taken.
Therefore 3 followed by 2 is the correct order. Therefore B is the correct answer.

46. B Actions 1, 3, and 5 are unethical because Mukesh is capitalizing on information he is privy to.
Action 4 is also unethical but to a lesser extent compared to 1, 3 and 5 though he is informing the consumers he is deliberately "understating the seriousness".
Whereas action 2 is ethical, 6 is not unethical. So the correct order would be: 2 > 6 > 4.
1, 3 and 5 are all unethical with no definite ranking among them. This rules out Option A, C, D and E.
Option B is definitely a wrong order and hence the correct answer.

47. E The objective is to bounce back i.e. resurrect the damaged image of the company and dispel all the doubts about their products. The company should ensure that such incidents are not repeated. The root cause of the problem is that the testing agency engaged in an inappropriate action (whereas the agency was supposed to be fair and neutral) at the behest of the competitor and this should be nipped in the bud.
Option A and C: The option does address the national outcry but does not address the proxy war by the competitor, which might recur.
Option B: The decision is inappropriate and not addressing the problem at all.
Option D: Their competitor is engaged in a proxy war. So, directly targeting the competitor will be a disaster.
Option E: The decision is appropriate as it targets the testing agency and not the competitor. It also addresses the national outcry indirectly because only a brand confident of its product quality will file a defamation suit. This in a way reassures the consumer about the product quality. Therefore Option E is the correct answer.

48. C

Time to harvest	Profit/unit	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
2	40	A	A											A	A										
2	50				B	B	B	B									B	B	B	B					
3	45																								
3	60									D	D	D										D	D	D	
4	60																								
4	40																								
Max Profit	200																								

Though crop E generates the same profit, we cannot produce E from Sep to Dec because in that case, crop A cannot be cultivated from Jan. Hence, the correct answer is Option C.

49. A

Time to harvest	Profit/unit	Cost/unit	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
2	40	20	A	A																						
2	50	5				B	B																			
3	45	25																								
3	60	15								D	D	D														
4	60	5								E	E	E	E									B				
4	40	35																								
Min Cost	30	ABE																								
Max Profit	150	ABE/ABD																								

Hence, the answer is Option A.

50. B Sum of the remaining numbers would be a GP series whose $a = 1$, $n = 100$ and $r = 3$.

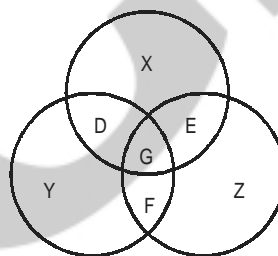
Thus, ratio would be $\frac{3^{100}}{\left[\frac{(1 \times 3^{100} - 1)}{3 - 1} \right]} = 2$

We are assuming (for all practical purposes) $1 \times 3^{100} - 1 \approx 3^{100}$

51. B From the main part we get:
A is highest.
 $B > D$.
E is not at 6th position.
C can have positions 2, 3 or 4.
Hence, 6th position holder can be D or F.
From Statement I: C is at 4th position.
Using Statement I we cannot confirm 6th position holder. It can be D or F.
Form statement II: $E = F$. As E is not in 6th position, F is also not in 6th position.
Then, D is 6th position holder.
Option B is the correct answer.

52. B Assume Rani sells X apples and Y oranges, where $X > Y$
Then, $23X + 10Y = 653$
Then try $X = 1, 11, 21$ etc. (to get last digit = 3)
We find $X = 21$ and $Y = 17$ is the only solution where $X > Y$
Cost of an Apple = $\frac{23}{1.15}$ and cost of an Orange = $\frac{10}{1.25}$
Overall cost = $\frac{483}{1.15} + \frac{170}{1.25} = 556$
Then profit = $653 - 556 = 97$
Profit percentage = $\left(\frac{97}{556} \right) \times 100 = 17.4\%$

53. E



Assume, M = Number of visitors who did not opt for any of A, B or C.
Given,
 $X + D + E + G = 77$
 $Y + D + G + F = 55$
 $Z + E + G + F = 50$
 $Z + M = 40$
 $E + G = 25$
 $D + G = 22$
 $G + F = 0$
Then, $G = 0$, $F = 0$.
 $E = 25$
 $D = 22$
 $X = 30$
 $Y = 33$
 $Z = 25$
 $M = 15$
Total number of visitors = $X + Y + Z + D + E + F + G + M = 150$
Hence, Option E is the correct answer.

54. B Area of any equilateral triangle = $\left(\frac{\sqrt{3}}{4} \right) \times (\text{side})^2$

$AB = 54$ cm. Then, $MR = 18$ cm.
Area of $\triangle YMR = 81\sqrt{3}$ sq. cm. and
area of $\triangle XYZ = 729\sqrt{3}$ sq. cm.
Finally, area of shape MNOPQRM

$$= 729\sqrt{3} - 3 \times 81\sqrt{3} = 486\sqrt{3} \text{ sq. cm.}$$

Using formula of hexagon, area of shape MNPQRM

$$= \left(\frac{3\sqrt{3}}{2} \right) \times 18^2 = 486\sqrt{3} \text{ sq. cm.}$$

55. D Given, $AB = AC$. Then $\angle ABC = \angle ACB$
 Also, $AC = CD$. Then $\angle CAB = \angle ADC = \angle ADB = 20^\circ$
 From the properties of triangle,
 $\angle ACB = \angle CAD + \angle ADC = 40^\circ$
 Now, $\angle BAC = 180^\circ - \angle ABC - \angle ACB$
 $= 180^\circ - 40^\circ - 40^\circ = 100^\circ$
 Finally, $\angle BAD = \angle BAC = \angle CAD = 100^\circ + 20^\circ = 120^\circ$.
 Hence, Option D is the correct answer.

56. A We should use 1 meter tiles (cost 100) before 0.5 meter side tiles (cost $4 \times 30 = 120$).

A	B
C	D

Area of A = 9×11 sq. meters
 Area of B = 0.5×11 sq. meters
 Area of C = 0.5×9 sq. meters
 Area of D = 0.5×0.5 sq. meters
 For A we need 99 tiles with 1 meter side

For B and C together we need $\frac{(11+9)}{2}$ tiles with 1 meter side

(we need to break each tile into two equal areas)

For D we need 1 tile with 0.5 meter side

Hence, the total cost = $9900 + 1000 + 30 = 10930$

57. C Suppose the distance between his home and office is x km.
 Then, distance between his office and temple is $(x - 1)$ km.
 If he walks at a speed of y km/hr. Then his driving speed = $8y$ km/hour, as he is 8 times faster in car.
 Then,

$$\frac{1}{y} + \frac{x}{8y} = \frac{(x-1)}{y}$$

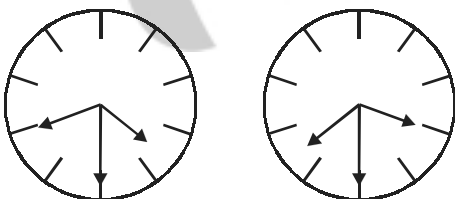
$$\text{Or, } 1 + \frac{x}{8} = x - 1$$

$$\text{Or, } x = \frac{16}{7}$$

$$\text{Finally, } x - 1 = \frac{9}{7}$$

Option C is the correct answer.

58. B



In the above figure, left side diagram shows mirror image and right side diagram shows actual clock.

From the drawing, actual time = 6 hours 17 min 20 seconds.

After 5 minutes actual time = 6 hours 22 min 20 seconds.

Option B is the correct answer.

59. A The smaller side of the isosceles triangle = 10
 Then the side of the square = 20 and the area of the square = 400 sq. cm.
 Option A is the correct answer.

60. A In an equilateral triangle, both circles have same centre (point B). Assume, AB is radius of circumscribed circle and BC is the radius of inscribed circle, where BCA is right angle. Then,

$$\frac{BC}{AB} = \sin 30^\circ = \frac{1}{2}$$

Let, $BC = x$ and $AB = 2x$.

Then, $AC = x\sqrt{3}$

Side of the triangle = $2x\sqrt{3}$

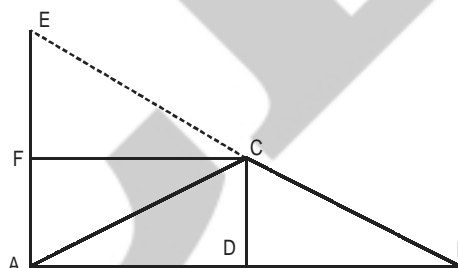
$$\text{Area of the triangle} = 12x^2 \frac{\sqrt{3}}{4}$$

$$\text{Then, } 4\pi x^2 - \pi x^2 = 2156; \text{ Or } x^2 = 2156 \times \frac{7}{66}$$

Finally, area of the triangle = $686\sqrt{3}$

Option A is the correct answer.

61. D



Given, $AB = 600$ meters. $\angle CAE = 60^\circ$. Assume D is the middle point of AB. Then $AD = 300$ meters.

As $\angle CAB = \angle CBA$, $CA = CB$ and $\angle ACD$ is right angled triangle.

$$\text{Also, } \frac{AD}{AC} = \cos 30^\circ = \frac{\sqrt{3}}{2}. \text{ Then, } AC = \frac{600}{\sqrt{3}} = 200\sqrt{3} = CB.$$

From Statement I:

$CE = 500$ meters. Assume F is perpendicular on AE.

Then, $\angle ACF = 30^\circ$ and $\angle CAF = 60^\circ$. Also, $CF = 300$ meters.

$$\text{Then, } \cos \angle ECF = \frac{300}{500} = \frac{3}{5}. \text{ So we can get the value of}$$

$\angle ECF$, the new angle.

From Statement II: $CE = 500$ meters = CA. Then,

$\angle ECF = 30^\circ$, which is different from the angle found using Statement I.

Hence, Option D is the correct answer.

62. D $f(31) = f(30) + 2 \times 31 = f(29) + 2(31 + 30) = f(28) + 2(31 + 30 + 29) = \dots = f(2) + 2(31 + 30 + 29 + \dots + 3) = 2(31 + 30 + 29 + 3 + 2) + 1$

$$= 2 \times 32 \times \frac{31}{2} - 1 = 991$$

63. C In decimal system the values are:
 $2061_B = 2B^3 + 6B + 1$ and $601_B = 6B^2 + 1$
 Then, $2B^3 + 6B^2 + 6B + 2 = 432$
 Or, $(B + 1)^3 = 216 = 6^3$
 Hence, $B = 5$
 Then, $1010_B = B^3 + B = 5^3 + 5 = 130$
 Option C is the correct answer.

64. E M inlet pipes can fill the $\frac{M^{\text{th}}}{8}$ part of the tank in 1 hour and N

outlet pipes can empty $\frac{N^{\text{th}}}{12}$ part of the tank in 1 hour. If all

pipes are left open, in 1 hour the tank will be filled = $\frac{M}{8} - \frac{N}{12}$

= $\frac{1}{6}$ (the tank will take 6 hours to fill).

Then, $6M - 4N = 8$

$$M = \frac{(8 + 4N)}{6}$$

There will be infinite number of solutions ($N = 1, 4, 7, 10, 13, 16 \dots$) but none of the above ratios are correct. For example, above equation is solvable when $M = 2, N = 1$ or $M = 4, N = 4$. But the ratios $2 : 1$ (i.e. $M = 2, N = 1$) or $1 : 1$ ($M = 4, N = 4$) are not correct because the solution of the above equation will not be an integer for values like $M = 4, N = 2$ or $M = 6, N = 6$. Therefore, Option E is the correct answer.

65. A For program to be profitable both companies must recover costs before they can start making profits.

Since, ABC wants to recoup investment in the first year and there is no limit of number of students profits can only be shared after both companies can reach a situation of minimum profits (zero profit), which would be:

$$400x + 100000 = 2000x,$$

Left hand side represents total costs and right hand side represents revenues. Let x be minimum number of students required to reach a situation of minimum profits (in this case 0).

For the entire program, the MINIMUM students required for

$$\text{minimum profit is} = \frac{100000}{(2000 - 400)} = 62.5 = 63$$

66. B 500 can be written as $5 \times 5 \times 5 \times 2 \times 2$. As the number is divisible by 500, $(a + b)$ should be divisible by 10.

Then, least possible value of $(a + b) = 10$

Hence, least possible value of $a \times b = 9 \times 1 = 9$ (when $a = 9$ and $b = 1$)

Option B is the correct answer.

67. C $AB + BC + CD = 70$

$$AB + BD = 45$$

$$AC + CD = 30$$

$$AC + CB + BD = 65$$

$$\text{Then, } (AB + BC + CD) + (AC + CB + BD) = 70 + 65 = 135$$

$$\text{Or, } (AB + BD) + (AC + CD) + 2BC = 135$$

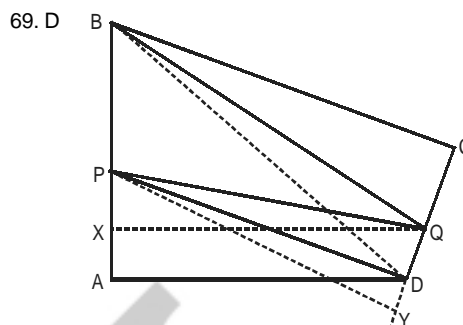
$$\text{Finally, } BC = 30$$

Option C is the correct answer.

68. C For maximum value, two of a, b, and c should be negative (all three negative will make abc negative). Hence the maximum will occur when $a = -10, b = -9$, and $c = 8$.

$$\text{Then, } abc = 731$$

Option C is the correct answer.



Let's assume $DQ = x, CQ = y, AP = z$. Thus, $BP = 2x$

Area of PBQD = Total area of the quadrilateral ABCD - (Area of triangle APD + Area of triangle BCQ)

Total area of the quadrilateral ABCD = Area of triangle ABD + Area of triangle BCD

Thus, Area of PBQD

$$\left[\frac{1}{2} \times (2x + z) \times 9 + \frac{1}{2} \times 13 \times (x + y) \right] - \left[\frac{1}{2} \times 9 \times z + \frac{1}{2} \times 13 \times y \right]$$

$$= \frac{31x}{2}$$

According to the question, $\frac{31x}{2} \leq 150$ or, $x \leq 9.68$.

Therefore, x can take 9 integer values. Option D is the correct answer.

70. C $a^3 + b^3 + c^3 - 3abc = (a + b + c) \frac{1}{2} \{ (a - b)^2 + (b - c)^2 + (c - a)^2 \}$

For three consecutive integers, $(x - 1), x$ and $(x + 1)$, $\{ (a - b)^2 + (b - c)^2 + (c - a)^2 \} = 6$, $(a + b + c) = 3x$ and $abc = x^3 - x$.

$$\text{Then, } \frac{a^3 + b^3 + c^3 + 3abc}{(a + b + c)^2} = \frac{(a + b + c)^3 - 3abc + 6abc}{(a + b + c)^2}$$

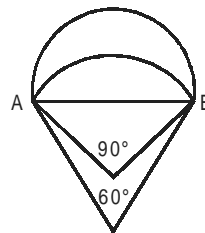
$$= \frac{9x + 6x^3 - 6x}{9x^2} = \frac{1}{3x} + \frac{2x}{3}$$

For the expression integer value is possible only if $x = 1$ and -1 .

Possible values of a, b, c are $(0, 1, 2)$ and $(-2, -1, 0)$.

Hence, Option C is the correct answer.

71. A



Here, curve X creates 90° and curve Y creates 60° .

Take, radius of curve X = R_1 and radius of curve Y = R_2

For curve Y, $2\pi R_2 = 10\pi \times 6$.

Then, $R_2 = 30 = \text{line AB}$.

Then, $R_1 = 15\sqrt{2}$

$$\text{Finally, length of curve X} = \frac{2\pi R_2}{4} = \frac{15\pi}{\sqrt{2}}$$

Option A is the correct answer.

72. E At least 25% of the students definitely got salaries between 20-30 lacs. in years 2008, 2010 and 2012. However, the graphs do not tell the actual salaries. Hence, no comment can be made on the number of students within a particular salary range.
Option E is the correct answer.
73. B It is clear from the above table that in 2012 and 2014, the median of existing year is higher than 1.6 times mean of previous years. Hence the correct answer is: 2012 and 2014.
Option B is the correct answer.
74. The question was withdrawn because of insufficient data.
75. A The answer can be found based on the table below:

$$\text{New Average Salary} = \frac{(\text{Old Average Salary}) \times 100}{(100 - \text{students without jobs})}$$
Based on the additional information, the new average would be higher than the graph average of all the years. During two years old averages were already higher than median (2008 and 2013). With 20 students taken out, the new average salary for 2010 would jump to 23.4, which is clearly higher than median salary of 22. Similarly, the value of 2013 would jump further by at least one hence making new average definitely higher than existing median. In 2008, even the existing mean is visibly higher than median. Hence, the three 3 years are: (2008, 2010, and 2013).
Option A is the correct answer.
76. D Since no data is given on population as well as distribution of states into four zones, it is not possible to calculate per thousand numbers.
77. C Option A and B can be one of the possible conclusions (there are many others) as average size of food shops in East India is higher.
Option D also is a possible conclusion as percentage given is 14.8, which can be converted into 740 (14.8×50) or a similar multiple of 14.8
Similarly Option E can also be a possible conclusion since 240 is a multiple of 12 ($12 \times 20 = 240$).
To conclude option C, we require additional data about number of customers and hence cannot be concluded on the basis of data above.
78. E Option A cannot be concluded as there is no mention of gross number in the two time periods.
Using a similar rationale, Option B, C and D cannot be concluded.
Option E can be concluded as population for *Pan Bidi* shops and Grocers is the same. These are percentages of the same base (total number of shops in East India)