

Unproctored Mock-20 2012

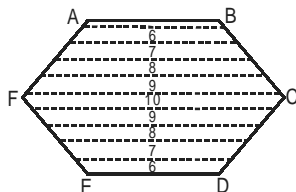
Answers and Explanations

1	b	2	c	3	d	4	d	5	a	6	c	7	d	8	c	9	b	10	a
11	c	12	a	13	b	14	a	15	a	16	a	17	c	18	b	19	a	20	c
21	d	22	b	23	b	24	c	25	a	26	d	27	a	28	b	29	b	30	c
31	a	32	d	33	a	34	b	35	d	36	a	37	d	38	a	39	d	40	c
41	a	42	c	43	b	44	c	45	b	46	d	47	d	48	b	49	a	50	b
51	c	52	c	53	c	54	d	55	d	56	d	57	c	58	d	59	b	60	c



1. b Since N has 4 factors, N must be of the form P_1^3 or $P_2 \times P_3$ where P_1, P_2, P_3 are prime numbers.
If N takes the form P_1^3 then P_1 can only be 3.
If N takes the form $P_2 \times P_3$ then the possibilities are:
Nine possible values where 2 is the smaller factor:
 $2 \times 5, 2 \times 7, 2 \times 11, 2 \times 13, 2 \times 17, 2 \times 19, 2 \times 23, 2 \times 29, 2 \times 31$
Seven possible values where 3 is the smaller factor:
 $3 \times 5, 3 \times 7, 3 \times 11, 3 \times 13, 3 \times 17, 3 \times 19, 3 \times 23$
Three possible values where 5 is the smaller factor:
 $5 \times 7, 5 \times 11, 5 \times 13$
So N can take $1 + 9 + 7 + 3 = 20$ values in all.

2. c



Since AB is 5 cm, CF would be 10 cm.
And the four equidistant lines drawn between them have to be of 6 cm, 7 cm, 8 cm and 9 cm long.
So the total length = $2(6 + 7 + 8 + 9) + 10 = 70$ cm

3. d $x^2 \cdot y^3 = 8$
 $\Rightarrow (2x) \cdot (2x) \cdot y \cdot y \cdot y = 2 \cdot 2 \cdot 8 = 32$
If the product of five variables is constant, then their sum would be minimum if the variables are equal.
For their sum, $4x + 3y$, to be minimum all of them must be equal to 2.
 $\Rightarrow 2x = y = 2$
 $\Rightarrow x = 1, y = 2$
So the minimum value of $4x + 3y$ will be 10.
4. d In the time Chaupat covers x m, Popat covers $(x - 18)$ m and Sarpat covers $(x - 24)$ m.
And in the time Popat covers x m, Sarpat covers $(x - 8)$ m.
So $\frac{x-18}{x-24} = \frac{x}{x-8}$
 $\Rightarrow x^2 - 26x + 144 = x^2 - 24x$
 $\Rightarrow 2x = 144$
 $\Rightarrow x = 72$
5. a $a^2 + ab + b^2 = 1$
So $a(a + b) + b^2 = 1$
and $b(a + b) + a^2 = 1$.
Adding the two equations we get:
 $(a + b)^2 + a^2 + b^2 = 2$
The integer pairs (a, b) satisfying the equation are:
(1, -1), (-1, 1), (1, 0), (0, 1), (-1, 0), (0, -1)
So 6 ordered pairs (a, b) are possible in all.

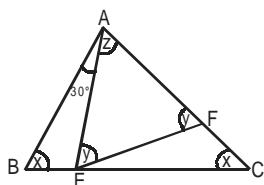
6. c The total production of Charyana in 1991 = 925
The percentage contribution = $\frac{925}{5600} \times 100 = 16.52$
The total production of Charyana in 1992 = 1165
The percentage contribution = $\frac{1156}{6300} \times 100 = 18.49$
The total production of Charyana in 1993 = 1300
The percentage contribution = $\frac{1300}{6700} \times 100 = 19.40$
7. d None of the three crops showed a decline in production for two consecutive years in Charyana.
8. c Bajra showed a decline in production in Charyana in 1992 despite showing an increase in production for two consecutive years in Khetistan.
9. b To maximise the number of incorrect responses, the number of correct responses should also be maximised.
Let the number of correct responses be x.
So the number of incorrect responses = $28 - x$
Total marks scored = $3x - (28 - x) > 22$
 $\Rightarrow 4x - 28 > 22$
 $\Rightarrow x > 12.5$
The least possible value of x = 13
So the answer = $28 - 13 = 15$
10. a Let's assume that the rectangle has m and n tiles along its length and breadth respectively.
The number of white tiles $W = 2m + 2(n - 2)$
 $= 2(m + n - 2)$
The number of red tiles $R = (m - 2)(n - 2)$
 $= mn - 2m - 2n + 4$
Also, $2W = R$ (given)
 $\Rightarrow 4m + 4n - 8 = mn - 2m - 2n + 4$
 $\Rightarrow mn - 6m - 6n + 12 = 0$
 $\Rightarrow (m - 6)(n - 6) - 36 + 12 = 0$
 $\Rightarrow (m - 6)(n - 6) = 24$
As m and n are integers, both $(m - 6)$ and $(n - 6)$ are integers as well. The possible sets of values where m, n are positive integers:
 $(m - 6, n - 6) = (24, 1), (12, 2), (8, 3), (6, 4)$
So $(m, n) = (30, 7), (18, 8), (14, 9), (12, 10)$
The maximum possible difference
 $= R - W = 2W - W = W$
 $= 2(m + n - 2) = 2(30 + 7 - 2) = 70$
11. c As he wants to save 10% of the total money, he can buy either 45 mangoes or 36 oranges. If he buys exactly 20 oranges then he can buy 16 more oranges with the money left.
Let M be the price of a mango and O be the price of an orange.
So $45M = 36O$
 $\Rightarrow O = \frac{5}{4}M$

$$\Rightarrow 16O = 16 \times \frac{5}{4}M$$

$$\Rightarrow 16O = 20M$$

So he can buy 20 mangoes with the money left.

12. a



Let $\angle ACB = \angle ABC = x$, $\angle AEF = \angle AFE = y$, $\angle EAF = z$.

$$y = \angle FEC + x \Rightarrow \angle FEC = y - x$$

$$\text{Now } 2y = 180^\circ - z \quad \dots(i)$$

$$\text{Also } 2x + 30^\circ + z = 180^\circ$$

$$\Rightarrow 2x = 150^\circ - z \quad \dots(ii)$$

$$\text{From (i) and (ii): } 2(y - x) = 30^\circ$$

$$\Rightarrow y - x = 15^\circ$$

$$\text{So } \angle FEC = 15^\circ$$

$$13. b \quad 4^7 \times 5^9 = 2^{14} \times 5^9 = 2^5 \times (10)^9 = 32000000000$$

$$2^4 \times 7 = 112$$

$$3 \times 5^3 = 375$$

$$2^6 \times 5^8 = 5^2 \times (10)^6 = 25000000$$

Adding the four numbers we get:

$$N = 32025000487$$

The distinct digits in N are 3, 2, 0, 5, 4, 8 and 7.

$$14. a \quad \text{The total number of arrangements possible} = \frac{11!}{(2!)^2}$$

$$\text{The total arrangements of 2 'A's and 2 'T's} = \frac{4!}{(2!)^2} = 6$$

Out of these 6 possible arrangements only 1 arrangement AATT is acceptable with the given condition.

So for every 6 arrangements of the letters of the word CATASTROPHE, only 1 would satisfy the given condition.

$$\text{Hence, the required arrangements} = \frac{11!}{(2!)^2 \cdot 6} = \frac{11!}{4!}$$

$$15. a \quad a^6 + b^6 = (a^2 + b^2)(a^4 + b^4 - a^2b^2)$$

Since $a^6 + b^6$ is divisible by $a^2 + b^2$, it can be prime only in two cases:

(i) $a^2 + b^2$ is 1: This is not possible since both a and b are integers.

(ii) $a^6 + b^6 = a^2 + b^2$: If a and b are distinct integers and $a^6 + b^6$ is prime, then this is possible only if

$$\rightarrow a = 1, b = -1$$

$$\rightarrow a = -1, b = 1$$

The sum of a and b is 0 in both the cases.

$$16. a \quad \text{Let } y = \frac{\frac{1}{a} + \frac{1}{b}}{1 + \frac{1}{ab}} = \frac{a+b}{ab+1}$$

$$ab = \left(\frac{\sqrt{8} - \sqrt{7}}{\sqrt{8} + \sqrt{7}} \right) \left(\frac{\sqrt{8} + \sqrt{7}}{\sqrt{8} - \sqrt{7}} \right) = 1$$

$$\Rightarrow y = \frac{a+b}{1+1} = \frac{a+b}{2}$$

$$\text{Also, } a = \frac{\sqrt{8} - \sqrt{7}}{\sqrt{8} + \sqrt{7}} = (\sqrt{8} - \sqrt{7})^2 = 15 - 2\sqrt{8}\sqrt{7}$$

$$\text{and } b = \frac{\sqrt{8} + \sqrt{7}}{\sqrt{8} - \sqrt{7}} = (\sqrt{8} + \sqrt{7})^2 = 15 + 2\sqrt{8}\sqrt{7}$$

$$y = \frac{a+b}{2} = 15$$

For questions 17 to 20:

Let's assume that the grade points awarded to Himanshu in English, Vijay in Math and Saral in Science are x, y and z respectively.

The sum of the five grade points for:

$$\text{Abhishek} = 39$$

$$\text{Saral} = 35 + z$$

$$\text{Himanshu} = 36 + x$$

$$\text{Puneet} = 44$$

$$\text{Vijay} = 30 + y$$

$$\text{Sanjay} = 42$$

Since Abhishek and Vijay get equal GPAs,

$$39 = 30 + y \Rightarrow y = 9 \Rightarrow Y \text{ lies in the range } 81-90.$$

Since the sum of the GPAs of Saral and Puneet is equal to the sum of the GPAs of Himanshu and Sanjay,

$$(35 + z) + 44 = (36 + x) + 42$$

$$\Rightarrow x = z + 1$$

Since the GPA obtained by Himanshu is the highest, x cannot be less than 9. (Otherwise Puneet's GPA would be either equal to or higher than Himanshu's GPA.)

If $x = 10$ then $z = x - 1 = 9$. In this case the GPAs of Saral and Puneet would become equal (which violates the condition given in the question).

$$\text{So } x = 9, z = 8.$$

$$\Rightarrow X \text{ lies in the range } 81-90, Z \text{ lies in the range } 71-80.$$

Sum of the marks obtained by the six students in:

$$\text{English} = 374 + X$$

$$\text{Hindi} = 470$$

$$\text{Math} = 445 + Y$$

$$\text{Science} = 391 + Z$$

$$\text{S.Sc.} = 462$$

Since the total marks in Science are definitely less than the total marks in Math, the total marks in Science should be more than the total marks in Hindi.

$$\text{So } 391 + Z > 470 \Rightarrow Z > 79 \Rightarrow Z = 80$$

The total marks obtained by:

$$\text{Abhishek} = 363$$

$$\text{Sara} = 422$$

$$\text{Himanshu} = 333 + X$$

$$\text{Puneet} = 421$$

$$\text{Vijay} = 283 + Y$$

$$\text{Sanjay} = 400$$

Since the total marks obtained by Himanshu are not the highest, his total should be less than Sara's total.

$$\text{So } 333 + X < 422 \Rightarrow X < 89$$

$$\Rightarrow X \text{ lies in the range } 81-88.$$

The final table looks like this:

	English	Hindi	Math	Science	S.Sc.
Abhishek	56	67	92	97	51
Sara	88	79	87	80	88
Himanshu	81-88	81	82	89	81
Puneet	83	90	91	78	79
Vijay	74	65	81-90	67	77
Sanjay	73	88	93	60	86

17. c

18. b

19. a

20. c

21. d Since the coefficient of x^2 is 0, the sum of the three roots of the equation is 0.

$$\text{If } a + b + c = 0, \text{ then}$$

$$a^3 + b^3 + c^3 = 3abc$$

$$= 3 \times \frac{-93}{3} = -93$$

22. b Let the n^{th} term of the A.P. be a_n and common difference be d .

$$a_{n+1} = a_1 + nd$$

$$a_{n+2} = a + (n + 1)d = (a + d) + nd = a_2 + nd$$

.

.

.

$$a_{2n} = a + (2n - 1)d = (a + (n - 1)d) + nd = a_n + nd$$

$$\text{Sum of first } n \text{ terms} = a_1 + a_2 + \dots + a_n = 100$$

$$\text{Sum of next } n \text{ terms} = a_{n+1} + a_{n+2} + \dots + a_{2n}$$

$$= a_1 + a_2 + \dots + a_n + n(nd) = 100 + n^2d = 300$$

$$\text{Hence, } n^2d = 200.$$

Also, sum of the first n terms

$$= \left(\frac{n}{2}\right)(2a + (n - 1)d)$$

$$= an + n^2 \frac{d}{2} - n \frac{d}{2}$$

$$= an + \frac{200}{2} - n \frac{d}{2} = 100$$

$$\text{Hence, } an = n \frac{d}{2}$$

$$\Rightarrow a : d = 1 : 2$$

23. b Himanshu starts at 7 a.m. and Sara at 8 a.m. So Himanshu would have covered 2 km by the time Sara

starts. Sara will catch Himanshu after $\frac{2}{3-2} = 2$ hours.

So Himanshu and Sara will be together at 10 a.m. after each has covered 6 km. Vikas also starts at 10 a.m. So the time taken by Himanshu to meet Vikas will

$$\text{be } \frac{6}{2+4} = \frac{6}{6} = 1 \text{ hour.}$$

So Himanshu and Vikas meet at 11 a.m.

24. c Two digit multiples of 8 are 16, 24, 32, 40, 48, 56, 64, 72, 80, 88 and 96. Out of these only two numbers - 40 and 48 satisfy the given condition. So the answer is 2.

$$25. a \quad f(1, 2) = f(0, f(1, 2 - 1))$$

$$(\text{as in } f(1, 2): m > 0 \text{ and } n > 0)$$

$$= f(0, f(1, 1))$$

$$= f(0, f(0, f(1, 1 - 1)))$$

$$(\text{as in } f(1, 1): m > 0 \text{ and } n > 0)$$

$$= f(0, f(0, f(1, 0)))$$

$$= f(0, f(0, f(1 - 1, 1)))$$

$$(\text{as in } f(1, 0): m > 0 \text{ and } n = 0)$$

$$= f(0, f(0, f(0, 1)))$$

$$= f(0, f(0, 1 + 1))$$

$$(\text{as in } f(0, 1): m = 0)$$

$$= f(0, f(0, 2))$$

$$= f(0, 2 + 1)$$

$$(\text{as in } f(0, 2): m = 0)$$

$$= f(0, 3)$$

$$= 3 + 1 = 4.$$

$$(\text{as in } f(0, 3): m = 0)$$

Also, from above:

$$f(0, f(1, 1)) = f(0, 3) \text{ or } f(1, 1) = 3.$$

$$\text{Hence, } 20[f(1, 2) + f(1, 1) + 15]$$

$$= 20 [4 + 3 + 15] = 20 \times 22 = 440.$$

31. a The author admits to disliking an entire group of people based on the actions of a few. Hence, the word 'bigot', which means 'one who regards or treats the members of a group (as a racial or ethnic group) with hatred and intolerance', fits best. 'Chauvinist' means 'a person who has undue partiality or attachment to a group or place to which he/she belongs or has belonged'. A 'fanatic' is also similar in meaning, it means 'marked by excessive enthusiasm and often intense uncritical devotion'. Both these words are inappropriate as the author is shown to be critical of a particular group and not excessively devoted or attached to any group. 'Philistine' means 'a person who is guided by materialism and is usually disdainful of intellectual or artistic values' and is completely irrelevant in the given context. Also, for the second blank we need a word with negative connotations since the author mentions that it 'festers'. Prejudice would therefore be appropriate.
32. d To answer this question we essentially need two contrasting words. Also, these words must describe accurately both Amundsen's and Scott's approaches. Options (a), (c) and (d) all have words which can fit in the first blank. However, the best word for how Scott viewed exploration is 'romantic' which means 'marked by the imaginative or emotional appeal of what is heroic, adventurous, remote, mysterious, or idealized.'
33. a All the other options are mentioned in the passage but option (a) is true of the Arms Act of 1878 and not the amendment.
34. b Refer to the lines *"It is no surprise that most gun lobbyists are representatives of feudal and other parasitical social classes, despite their attempt to speak in the name of the 'citizen'."*
35. d Refer to the lines *"The post-colonial law laid down strict rules for gun ownership, reducing the number of firearms which could be owned by one person but made it uniform for all citizens."* Options (b) and (c) are mentioned but they do nothing for the perceived bias. Option (d) effectively eliminates the bias by making the laws uniform for all citizens. Option (a) cannot be inferred from the passage. We do not know if all citizens have the **right** to possess guns.
36. a Option (b) is incorrect as the passage does not describe all the aspects of gun possession laws. Option (c) is also incorrect. Although the author does argue in favour of measures that would curtail illegal possession of guns, it is not the main idea. Option (d) is not appropriate as the author does not actively endorse the amendments rather he/she opposes people or arguments against the amendments.
37. d 38. a 39. d
40. c The passage ends with a specific instance of teachers in Rajasthan. Option (c) is the only one that continues with this idea. All the other options bring in new ideas or conclusions.
41. a Option (a) continues the idea of how these buildings would appear to someone flying over human settlements.
42. c The paragraph highlights the popularity of a camera phone and the limitations it suffers from because of its size. Option (c) continues in the same vein and tells us about a small camera chip (about 8 mm across) that is used in these phones. Option (a) is completely different in tone – it tells us about an endeavour by a particular firm. Option (b) is out of the question as it goes into the technicalities of how an image is formed. Option (d) focuses on the camera being a fringe-benefit.
43. b The sentence immediately after the blank states "He had a simpler idea". Therefore the sentence in the blank needs to have another idea/suggestion by the psychologist. Option (b) is the only one that fits.
44. c Option (a) is only one of the ways in which aesthetic perception has been understood by the author. Option (b) can be eliminated, as the passage does not mention the power of aesthetic perception. Option (d) again talks about only one of the two main alternatives. Option (c) is the correct choice as the passage is about the alternative paths/ modes/theories of aesthetic perception.
45. b Option (a) is encompassed by the aesthetics of illusion in paragraph 4. Option (c) is talked about in paragraph 3 as part of the aesthetics of being. Refer to the lines *"Both variations of an aesthetics of being do, however, assume that general structures of reality can be recognized in or by means of aesthetic perception."* But option (b) is not talked about in the passage. No alternative leads to the being disclosing the characteristics of illusion. Hence option (b) is correct.
46. d Option (a) can be inferred from the lines in the last paragraph. *"According to this fixation, aesthetic consciousness paves the way either to a higher reality or out of the lower reaches of reality or it goes both ways simultaneously."* Option (b) is explicit in the last lines of paragraph 3. Option (c) is referred to in paragraph 5 among the examples of aesthetic perception "Bloch's aesthetics of anticipating [Vorschein] a better society in the future." All the examples are variations of aesthetic perception. Option (d) is correct as we cannot infer the being to be illusionary in character, but we can infer that there is an illusion which can reveal characteristics of a higher being.

For questions 37 to 39:

Colour	Red/Blue	Blue/Red	Green	White
Name	Priya	Sonal	Qureshi	Rahul
Profession	Lawyer	Engineer	Doctor	Cricketer

47. d A, D and F cannot be selected together as D doesn't hate any of the likings of A and F i.e. reading, travelling and fishing.
The rest two sets of people can be selected together.

48. b One team will have 3 members and the other will have 4 members. There are only two possible cases:

(i) 3-member team: Sajid, Salim, Sanjay
4-member team: Reeta, Sunil, Hasan, Govind

(ii) 3-member team: Reeta, Salim, Sanjay
4-member team: Sajid, Sunil, Hasan, Govind

Statement (1) is true in both the cases.

Statement (2) is true in case (i).

Statement (3) is false in both the cases.

49. a (D-A) would be a mandatory pair here as they connect the ideas of soothsayers and shrines. Similarly (E-D) fit together as they both convey the idea of a filthy place. The only option where we find this combination is option (a).

50. b (B-D) is a mandatory pair as "the life cycle" in B is referred to as "this trajectory" in D. Similarly, (C-E) should come together as they discuss the idea of when this framework ceases to function in the absence of men. Statement A then follows as a conclusion.

51. c The correct usage would have been "cover for him" which would mean "substitute or take the place of someone".

52. c The correct usage would have been "figure in some additional expenditure". "Figure in" means "take into consideration".

53. c All the other options are supported by the passage. Option (a) is mentioned in the second paragraph. Refer to the lines "*Instead, the famously reticent painter...*". Option (b) can be inferred from these lines in the second paragraph "*He was surprised when the answer was yes, and that Freud wanted to get cracking right away.*" Option (d) can be inferred from the third paragraph "*When he paints, Freud talks, and he likes to go to a restaurant with the sitter after each session to carry on talking.*" Option (c) is actually a statement about Gayford. "*Gayford downplays his own, but actually it is his craft as a storyteller that turns...*"

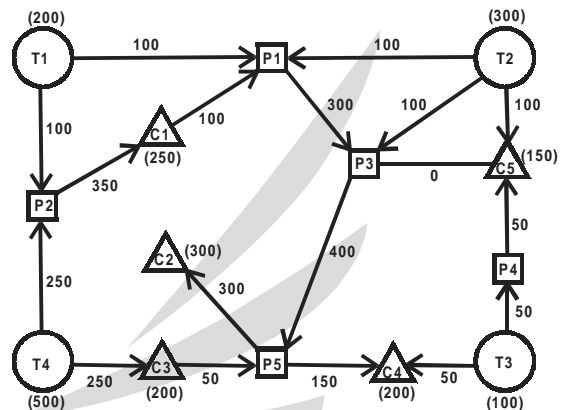
54. d All the other options are incorrect according to the passage. Option (a) is incorrect as it is a statement about Gayford. Refer to these lines in the second last paragraph "*He is unpretentious and natural, and above all wants to capture Freud as a person.*" Option (b) also cannot be inferred as the passage only mentions that quotes from Freud steal the show, we cannot infer that this happens to the detriment of Gayford's

writing. Option (c) is also incorrect as the passage clearly mentions – "*But this book is not just for Freud fans, or a sombre intellectual document for art students.*"

55. d The focus of the article is not on Lucien Freud or Martin Gayford, rather it is on how they collaborated for the book 'Man with a blue scarf'. At the same time the passage is not a book review as it does not really evaluate the book. It works more as a piece of writing that describes the book and how it was written.

For questions 56 to 59:

The figure can be completed on the basis of the given information. It would look like this:



56. d 57. c 58. d 59. b

60. c It's given that the winner gets a final score of 220 and no participants gets more than 45 marks from any of the judges.

Bali cannot be the winner because even if he gets 45 marks from each of the judges A, C, D and E, he would be able to reach a final score of 217 only.

Shonali cannot be the winner because even if she gets 45 marks from each of the judges A, B, D and E, she would be able to reach a final score of 219 only.

Gaurav cannot be the winner as his final score is less than that of Shonali.

Let the final scores of Angad, Gaurav, Monica and Shonali be 'a', 'g', 'm' and 's' respectively.

Therefore, as per the given condition $\frac{a+g}{2} > \frac{m+s}{2}$.

Since 's' is greater than 'g', 'a' would be greater than 'm'. So Angad is the winner.