

Unproctored Mock-13 2011

Answers and Explanations

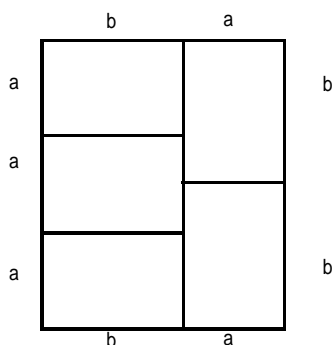
1	d	2	c	3	d	4	a	5	a	6	b	7	a	8	c	9	c	10	b
11	b	12	d	13	c	14	a	15	b	16	b	17	d	18	a	19	b	20	c
21	c	22	a	23	c	24	a	25	a	26	b	27	b	28	c	29	c	30	c
31	b	32	d	33	a	34	d	35	c	36	d	37	d	38	c	39	d	40	a
41	c	42	a	43	d	44	d	45	b	46	d	47	b	48	d	49	d	50	c
51	a	52	d	53	b	54	d	55	b	56	b	57	c	58	d	59	c	60	d

1. d Let the two digit number be 'ab', then
 $10a + b = a^2 + b^2$
 $10a - a^2 = b^2 - b$
 $a(10 - a) = b(b - 1) \rightarrow$ Now $b(b - 1)$ is always even as the product of two consecutive digits is also even.
 $\Rightarrow a(10 - a)$ can be $\rightarrow 2 \times 8 = 16$ or $4 \times 6 = 24$
Neither 16 nor 24 can be the product of two consecutive numbers such as $(b - 1)$ and b .
Hence, option (d) is the correct choice.

2. c Initial rate of developing questions per week
 $= \frac{2500}{10} = 250$ questions.
After six weeks, total developed questions
 $= 250 \times 6 = 1500$ questions
Remaining questions $= 2500 - 1500 = 1000$
So, instead of developing 250 questions, the team has to develop 1000 questions in the 7th week.

$$\text{Required increase in the rate} = (1000 - 250) \times \frac{100}{250} = 300\%$$

3. d Let the lengths and breadths of each of the small rectangles be 'b' m and 'a' m respectively.



$$\therefore 5a + 4b = 88$$

$$\text{and } 3a = 2b$$

$$\Rightarrow a = 8 \text{ and } b = 12$$

$$\text{Perimeter of each small rectangle} = 2(a + b) = 40$$

4. a This means 3 rotten apples and 1 apple that is not rotten is taken out in four days.
The apple that is not rotten can be taken out on any of the four days.

Case I:

The apple that is not rotten is taken out on the first day.

$$\text{Probability} = \frac{9}{15} \times \frac{6}{14} \times \frac{5}{13} \times \frac{4}{12}$$

Case II:

The apple that is not rotten is taken out on the second day.

$$\text{Probability} = \frac{6}{15} \times \frac{9}{14} \times \frac{5}{13} \times \frac{4}{12}$$

Case III:

The apple that is not rotten is taken out on the third day.

$$\text{Probability} = \frac{6}{15} \times \frac{5}{14} \times \frac{9}{13} \times \frac{4}{12}$$

Case IV:

The apple that is not rotten is taken out on the fourth day.

$$\text{Probability} = \frac{6}{15} \times \frac{5}{14} \times \frac{4}{13} \times \frac{9}{12}$$

$$\text{Required Probability} = 4 \times \left(\frac{9}{15} \times \frac{6}{14} \times \frac{5}{13} \times \frac{4}{12} \right) = \frac{12}{91}$$

5. a Given that $F(n - 1) = \frac{1}{(2 - F(n))}$ and $F(1) = 2$.

$$\text{For } n = 2: F(1) = \frac{1}{(2 - F(2))} \Rightarrow F(2) = \frac{3}{2},$$

Similarly, one can find the values of $F(3)$, $F(4)$, $F(5)$ as

$$\frac{4}{3}, \frac{5}{4} \text{ and } \frac{6}{5} \text{ respectively.}$$

$$\Rightarrow F(n) = \frac{n+1}{n}$$

From this we can say that every term except $[F(1)]$, of the series $[F(1)] + [F(2)] + \dots + [F(50)]$ is equal to 1 as for ' n ' > 0, $F(n)$ lies between 1 and 2.

$$\text{Therefore, } [F(1)] + [F(2)] + \dots + [F(50)] = 51.$$

Hence, option (a) is the correct choice.

6. b $N = 2^6 \times 3^4 \times 5^2$; has 105 factors in total.

Let the factors of N be f_1, f_2, \dots, f_{105} be arranged in ascending order.

$$N = f_1 \times f_{105} = f_2 \times f_{104} = \dots = f_{53} \times f_{53}$$

\Rightarrow Product of the factors of N :

$$P = (f_1 \times f_2 \times f_3 \dots f_{53} \times f_{105}) = (2^6 \times 3^4 \times 5^2)^{(52 + 1/2)}$$

$$P = (2^6 \times 3^4 \times 5^2)^{105/2} = 2^{315} \times 3^{210} \times 5^{105}$$

product of the factors of N , which are not multiples of 5

$$= (2^6 \times 3^4)^{35/2} = 2^{105} \times 3^{70}$$

So, total product of the factors of N which are multiples of 5.

$$= \frac{2^{315} \times 3^{210} \times 5^{105}}{2^{105} \times 3^{70}}$$

$$= 2^{210} \times 3^{140} \times 5^{105}$$

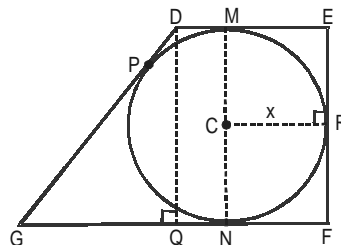
Alternate method:

Out of 105 factors of N , 35 factors contain (5^0) , (5^1) and (5^2) respectively.

Hence, product of all the factors containing at least one (5) will have $(5^1)^{35} \times (5^2)^{35} = (5^{105})$

Option (b) is the correct choice.

7. a



Let, the radius of circle be ' x ' cm.

$$\therefore CM = CN = CR = x$$

Given that $GN = 4$ cm

$\therefore GP = 4 \text{ cm}$
 Also, $DP = DM = QN = 1 \text{ cm}$
 $\therefore GD = 5 \text{ cm}$
 $GQ = GM - QN = 4 - 1 = 3 \text{ cm}$

In $\triangle DGQ$: $DQ = \sqrt{GD^2 - GQ^2} = 4 \text{ cm}$

$\Rightarrow 2x = 4 \text{ cm} (\because DQ = MN)$

$\therefore x = 2 \text{ cm}$.

8. c List price first increases by 10% and then decreases by 10%.

$$\Rightarrow \left(\frac{100+10}{100}\right) \times \left(\frac{100-10}{100}\right) \times \text{initial list price} = \text{final list price}$$

$$\Rightarrow \text{Initial list price} = \frac{20 \times 100^2}{100^2 - 10^2}$$

9. c Given that $f(x) = x^3 - x^2(3+a) + x(2+3a) - 2a > 0$

$$\Rightarrow x^3 - x^2a + 2x - 2a + 3ax - 3x^2 > 0$$

$$\Rightarrow x^2(x-a) + 2(x-a) - 3x(x-a) > 0$$

$$\Rightarrow (x^2 - 3x + 2)(x-a) > 0$$

$$\Rightarrow (x-1)(x-2)(x-a) > 0$$

Since, 'a' is an odd prime number, therefore 'a' is not less than 3.

Therefore, the range of values of 'x' for which $f(x) > 0$ is $1 < x < 2$ or $x > a$.

Hence, option (c) is the correct choice.

10. b Let the total number of large boxes that have been left empty in the game = 'x'.

Therefore, the total number of medium boxes used by Richa is $5 \times (9-x) = 45 - 5x$.

Let the total number of medium boxes that have been left empty in the game = 'y'.

Therefore, the total number of small boxes used by Richa is $5 \times (45 - 5x - y) = 225 - 25x - 5y$.

It is also known that total number of boxes that have been left empty = 41.

$$\text{Therefore, } x + y + 225 - 25x - 5y = 41.$$

$$24x + 4y = 184.$$

$$6x + y = 46.$$

Total number of boxes used by Richa in the game is $9 + 45 - 5x + 225 - 25x - 5y = 279 - 5(6x + y) = 279 - 5 \times 46 = 49$.
Hence, option (b) is the correct choice.

11. b Suppose that the total amount involved in this game is \$K.

The first person has $\frac{7}{18}K$ in the beginning and $\frac{6}{15}K$ in the end. Thus he won something.

Second person has $\frac{6}{18}K$ in the beginning and $\frac{5}{15}K$ in the end.

So he neither gains nor loses. At this point it is very clear that third person loses something.

$$\Rightarrow \frac{6}{15}K - \frac{7}{18}K = 12. \text{ So, } K = 1080.$$

So, the winner must have started with \$420.

$$12. d \quad x - \frac{1}{10-2x} - 5 = (x-5) + \frac{1}{2(x-5)}$$

Since, $x > 5$ both $(x-5)$ and $\frac{1}{2(x-5)}$ are greater than 0.

Applying A.M. \geq G.M

$$(x-5) + \frac{1}{2(x-5)} \geq 2\sqrt{\frac{1}{2}}$$

Also, the equality holds true when $x-5 = \frac{1}{2(x-5)}$ and at this value of 'x', the value of the given expression will be minimum.

$$\Rightarrow (x-5)^2 = \frac{1}{2}$$

$\therefore x > 5$, therefore the minimum value of the expression is

$$\text{attained at } x = 5 + \frac{1}{\sqrt{2}}.$$

13. c Assuming, number of days = x and cost per day = y
So, cost = $x \times y = \text{Rs. } 1347$

$$\text{Now, new number of days} = \frac{20}{21}x$$

$$\text{New wages/day} = \frac{9}{8}y$$

$$\text{So, new cost} = \frac{20}{21} \times \frac{9}{8}xy$$

$$= \text{Rs. } 1443.2$$

Alternative method:

Obvious and very simple solution is

$1347 \xrightarrow{5\% \downarrow} \xrightarrow{12.5\% \uparrow} 1440$. [Please note that 5% reduction is just an approximate]

On the calculation part, Reducing by 5% and increasing by 12.5% makes 100 equal to 107 approximately. So, effectively it is a net increase of 7% over Rs. 1347.

Now, eliminating the options, (a) and (d) can be outrightly rejected. (b) cannot be a choice because % increase is too big. So, (c) is the answer.

14. a The total number of silver coins has to be multiple of three i.e., the total number of coins in five out of the six boxes should be a multiple of three. 15 and 18 are already in the form $3n$.

We see that three boxes (containing 31, 19 and 16) has $(3n+1)$ number of coins each, and one box containing 20 coins is of the form $(3n+2)$.

Hence, the total number of gold coins has to be 20 as the coins in the other five boxes sum up to a multiple of three.

Hence, option (a) is the correct choice.

15. b Let, the values of 'x' and 'z' be denoted by $(y-2\sqrt{5})$ and $(y+2\sqrt{5})$

$$25 = (y-2\sqrt{5})(y+2\sqrt{5})$$

$$\Rightarrow y^3 = 25 + 20y$$

$$\Rightarrow y = 5 [\because \text{Other two roots of } y \text{ are roots of } y \text{ are negative}]$$

$$\text{Therefore, } x + y + z = 3y = 15$$

For questions 25 to 28:

	Number of movies NOT Liked	Number of movies Liked
Shefali	6	2
Shreyas	3	5
Nitin	4	4
Richa	5	3
Devendra	7	1
Pankaj	0	8
Abhishek	2	6
Ashraf	1	7
Priyanka	4	4
Amit	5	3
Total	37	43

25. a Aggregate number of students who liked the movies P, Q, R, S, T, U and V is $10 + 9 + 1 + 4 + 6 + 3 + 8 = 41$
 So, the number of students who liked the movie W = $43 - 41 = 2$.
 Therefore, the number of students who did not like the movie W = $10 - 2 = 8$.

For questions 26 to 28:

Since, every student liked the movie P and Devendra liked only one movie, therefore Devendra definitely liked P.

Nine students liked the movie Q and hence everyone except Devendra liked the movie Q.

Shefali liked only 2 movies and they have to be P and Q.

Hence, every student except both Devendra and Shefali liked the movie V.

It is also known that R is liked by only one student. So, it has to be Pankaj as he likes all the movies. Hence, Ashraf likes all the movies except R.

Following the similar logic, we can get the list of the students who did not like each of the given eight movies.

The following is the list of all the students who did not like each of the given eight movies

Movies	No. of Students	Names
P	0	
Q	1	Devendra
V	2	Devendra and Shefali
R	9	Devendra, Shefali, Amit, Richa, Nitin, Priyanka, Shreyas, Ashraf, Abhishek
S	6	Devendra, Shefali, Amit, Richa, Nitin, Priyanka
T	4	Devendra, Shefali, Amit, Richa
U	7	Devendra, Shefali, Amit, Richa, Nitin, Priyanka, Shreyas
W	8	Devendra, Shefali, Amit, Richa, Nitin, Priyanka, Shreyas, Abhishek

26. b

27. b

28. c Out of the given eight movies, there is only one movie, i.e. T, which is not liked by Richa but is liked by Nitin.

For questions 29 to 33: The total marks obtained by the students and their overall ranks are tabulated in the following table:

NAME	Gender	Center	Rank	Total	NAME	Gender	Center	Rank	Total
Dennis	M	I	7	40	Sagarika	F	I	6	41
Preeti	F	II	12	36	Manish	M	II	5	44
Anurag	M	III	9	38	Nitya	F	III	15	33
Pronab	M	I	3	50	Aditi	F	III	10	38
Abishek	M	III	2	52	Avni	F	II	4	46
Shefali	F	II	11	36	Anshul	M	I	8	39
Reema	F	I	16	27	Sachin	M	II	13	34
Rahul	M	II	1	53	Nidhi	F	III	14	33

29. c Rank of Nidhi is 14.

30. c Five male students namely Manish, Abishek, Pronab, Anurag and Dennis satisfy the condition given in the question.

31. b Two female students namely Preeti and Shefali have obtained more marks than one male student namely Sachin and more marks than three female students namely Reema, Nitya and Nidhi.

32. d Overall rank of Anshul is 8 and center rank of Anshul is 4. Therefore, the required difference is $8 - 4 = 4$.

33. a From center I as well as center II, there are three students who have obtained atleast 40 and atmost 54 marks.

For questions 34 to 36:

From the given information, we can summarize the data in the following table:

	Akansh	Ajay	Ashok	Abhishek	Amit
Salaries (In Rs. Lakh)	7 or 13	11	13 or 7	9	8
Cities:	K/V	B/K/V	B/K/V	Prabandhnagar	Joka

Where 'K', 'V' and 'B' stands for 'Kunnamangalam', 'Vastrapur' and 'Banerghatta' respectively.

34. d If Akansh, lives in Vastrapur, then Ajay and Ashok must be staying at Kunnamangalam and Banerghatta, not necessarily in that order. Their average salary in any case will be Rs.12 lakhs or 9 lakhs. So, the data is insufficient.
35. c Amit called a friend, who gets Rs. 9 lakh as his salary is a perfect square multiple of 100000 and stays in Prabandhnagar. Abhishek stays in Prabandhnagar.
36. d Amit lives in Joka, so Ajay must be living at Kunnamangalam. Since Akansh is not staying at Banerghatta, he must be staying at Vastrapur.

For questions 37 to 40:

37. d If the average Octane Number of two Indian Petroleum products is 91.5, then these two products must be having Octane Numbers in the following combinations: (87,96) or (90,93). But, nothing can be said regarding the Octane number of the US petro product; It may be less than 90 or more than or equal to 90.
Similarly, Indian Petroleum products may have an average Octane Number equal to 90, if we consider the following combination of Octane Numbers for them: (87, 90, 93). So, statement II is not definitely true.
Again, the petro product with Octane Number 96, may be produced by the US company. Just observe the combination suggested above.
None of the given statements are definitely true.
38. c Taking any 3 values out of 4 given values of the Octane and Cetane Numbers, we get the possible average Octane Numbers and average Cetane Numbers of the Indian Petroleum products as follows:
Possible values of average Cetane Numbers: 45, 46.66, 48.33, 50
Possible values of average Octane Numbers: 90, 91, 92, 93
Considering various combinations, we can observe that a difference of 42 is only possible when average Octane Number is 92 and average Cetane Number is 50.
Again an average Octane Number of 92 is only possible with Octane Numbers 87, 93 and 96. That Means the product of the US company must have got an Octane Number of 90.
Similarly an average Cetane Number of 50 is only possible with Cetane Numbers 45, 50 and 55. That Means the product of the US company must have got an Cetane Number of 40.
39. d According to the statement II, all four will be Indian products. This is definitely false. All other statements can be true for some cases.
40. a If the Cetane Number of the US petroleum product is less than 50, then it must be either 40 or 45. For minimum value of the average Cetane Number of Indian Petroleum products, US product should have a Cetane Number of 45. Then the required average is $(40 + 50 + 55)/3 = 48.33$

41. c AC and CB are mandatory pairs as the theme of "marriage and divorce" runs through them. "Saturday night" should follow right after "meeting people" as it is a case of specific from general. Thus D is the opening sentence AC and CB. Hence option (c) becomes the correct answer.
42. a In this paragraph there is a description in general of any Saturday morning; then the author moves to describe one particular "Saturday morning". Sentences A and C describe "Saturday mornings" in general. "More so" in A relates to "pretty chaotic" in the opening sentence, thus A comes before C. B moves from the general description to the specific example of a given "Saturday", thus it follows C. D is a continuation of events in C. Thus ACBD becomes the correct sequence.
43. d The given order of the paragraph is correct. Statement 1 speaks of an expert. In A, it becomes clear that the expert is Daniel Tarantola. The idea in A is further expanded in B and C. D talks of one more expert -also from UNSW- David Cooper. 6 provides a contrast to D. Hence choice (d) is best.
44. d Option (d) is incorrect as a game cannot be 'see through', one can use it in the sense of a strategy in a sentence like "I saw through their game", which means to be able to ascertain the strategy. In option (a) it means the score at a particular stage in a game, in (b) it is a particular manner or style of playing a game, in (c) it is any object of pursuit, attack, abuse, etc.
45. b Option (b) is incorrect as it seems that the accounts were fighting with each other. 'On conflict' is an incorrect usage. The correct usage should be "The two accounts of what had happened were conflicting", in option (a) it means disagreement, in (c) it means a state of opposition between persons or ideas or interests and in (d) it means opposition between two simultaneous but incompatible feelings.
46. d Option (d) is incorrect, no such thing as 'pure genetics' exists, and the correct usage is 'pure lineage'. In option (a) the word means a homogeneous or uniform composition, in (b) it means free of dirt and in (c) it means sinless.
47. b You have to choose the statement that is incorrect. The third line of the passage denies the statement in option (b) that Orwell would do it for the sake of producing a great work of art. Hence option (b) is false, which makes it the correct answer.
48. d Option (d) is the correct answer as it cannot be concluded from the passage that Orwell had an exaggerated notion of himself. The other statements can be concluded from the passage.
49. d The passage seems to be exploring the purpose behind Orwell's writing and more specifically - the purpose behind writing 'Animal Farm' The purpose is not to criticize Animal Farm. Hence option (a) is ruled out. The other options are too general or off the central theme.
50. c It can be discerned from line 11 of the paragraph that Animal farm attempts to clarify in the minds of readers, what Orwell felt Russia had become. It was also intended to be a satire on dictatorship in general. A holistic reading of the passage leads to option (c) as the best among the choices. Option (c) is best in terms of tone and theme.
51. a Option (a) can be concluded from the last part of the passage where the 'moral' purpose behind Orwell's work is connected to the form traditionally associated with the moral-the animal fable.

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| <p>52. d In the first sentence, 'undisputable' is incorrect, the correct word being 'indisputable'. In sentence B, the preposition 'in' must be replaced with 'for'.</p> <p>53. b In the first sentence, one realizes that pollution will have more than one problem, thus the word should be 'problems', keeping it parallel to the verb 'resemble' which is also plural. In sentence C air is not 'valued', but it is 'valuable', thus making the word an adjective. In sentence D, the word 'reducing' is a gerund, what is required is a noun, thus 'reduction'.</p> <p>54. d B—Should be 'About' going fast.</p> <p>55. b A —'aren't' is incorrect should be 'isn't' — subject verb agreement
B—should be "are" getting smaller—subject verb agreement
D—Should be 'where is'.</p> <p>56. b BBAAA: The sentence is in the past tense so option '(b)' is correct, heel means the part of the foot and heals - to cure. Assented means to agree and ascent an upward movement, Plum is a fruit and plumb means to examine closely or deeply. Choral means of a choir and coral is the hard, variously colored, calcareous skeleton secreted by certain marine polyps as in, something made of coral.</p> <p>57. c ABBA: Scull means a pair of oars and skull the head as the center of knowledge and understanding, Levee is an embankment designed to prevent the flooding of a river and Levy-an imposing or collecting of a tax. 'Who' is used for people, here the subject is offer so 'that' should be used, and the definite article should be used before union.
Profit is to gain an advantage or benefit, prophet is a person who practices divination.</p> | <p>58. d The author talks about this in the fourth paragraph at the beginning – "The <i>philosophes</i> had also attacked the Church because it blocked human reason. The Romantics attacked the Enlightenment because it blocked the free play of the emotions and creativity. The <i>philosophe</i> had turned man into a soulless, thinking machine — a robot." This proves that the Romantics who came after the philosophes were fighting against the over dependence on reason and harking back to emotions. This makes choice (d) correct.</p> <p>59. c The author mentions this at the end of the third paragraph. "The Romantics were conscious of their unique destiny. In fact, it was self-consciousness which appears as one of the key elements of Romanticism itself" making choice (c) correct.</p> <p>60. d The author mentions in the second paragraph – "To speak of a Romantic era is to identify a period in which certain ideas and attitudes arose, gained currency and in most areas of intellectual endeavor, became dominant. That is, they became the dominant mode of expression. Which tells us something else about the Romantics: expression was perhaps everything to them". None of (a), (b) or (c) talks about this.</p> |
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