ANSWER with SOLUTION

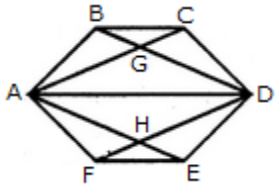
SET – 3

Question 1: Ans- B

There are 16 + 9 + 4 + 1 = 30 squares in the given figure.

Question 2: Ans- D

The figure may be labelled as shown.

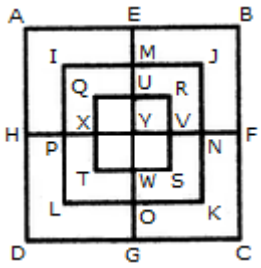


The quadrilaterals in the figure are ABCD, ABDE, ABDF, ABDH, CDHA, CDEA, CDFA, DEAG, DEFA, FAGD and AGDH.

The number of quadrilaterals in the figure is 11.

Question 3: Ans- C

The figure may be labelled as shown.



The simplest squares are QUYX, URVY, YVSW and XYWT i.e. 4 in number.

The squares composed of two components each are IMYP, MJNY, YNKO and PYOL i.e. 4 in number.

The squares composed of three components each are AEYH, EBFY, YFCG and HYGD i.e. 4 in number.

There is only one square i.e. QRST composed of four components.

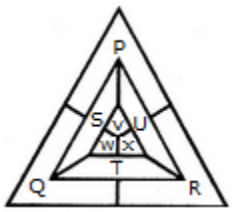
There is only one square i.e. IJKL composed of eight components.

There is only one square i.e. ABCD composed of twelve components.

Total number of squares in the given figure = 4 + 4 + 4+1 + 1 + 1 = 15.

Question 4: Ans- D

The figure may be labelled as shown.



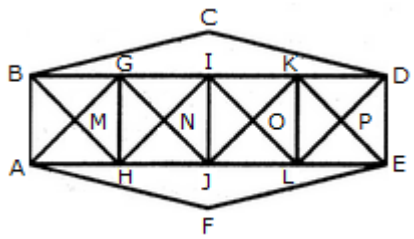
The spaces P, Q and R have to be shaded by three different colours definitely (since each of these three spaces lies adjacent to the other two).

Now, in order that no two adjacent spaces be shaded by the same colour, the spaces T, U and S must be shaded with the colours of the spaces P, Q and R respectively.

Also the spaces X, V and W must be shaded with the colours of the spaces S, T and U respectively i.e. with the colours of the spaces R, P and Q respectively. Thus, minimum three colours are required.

Question 5: Ans- C

The figure may be labelled as shown.



Triangles:

The simplest triangles are BGM, GHM, HAM, ABM, GIN, UN, JHN, HGN, IKO, KLO, LJO, JIO, KDP, DEP, ELP, LKP, BCD and AFE i.e. 18 in number.

The triangles composed of two components each are ABG, BGH, GHA, HAB, HGI, GIJ, IJH, JHG, JIK, IKL, KLJ, LJI, LKD, KDE, DEL and ELK i.e. 16 in number.

The triangles composed of four components each are BHI, GJK, ILD, AGJ, HIL and JKE i.e. 6 in number.

Total number of triangles in the figure = 18 +16 + 6 = 40.

Squares :

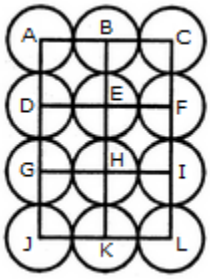
The squares composed of two components each are MGNH, NIOJ and OKPL i.e. 3 in number.

The squares composed of four components each are BGHA, GIJH, IKLJ and KDEL i.e. 4 in number.

Total number of squares in the figure = 3 + 4 = 7.

Question 6: Ans- C

The figure may be labelled as shown.



We shall join the centres of all the circles by horizontal and vertical lines and then label the resulting figure as shown.

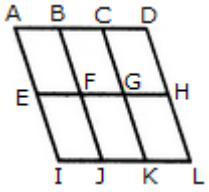
The simplest squares are ABED, BCFE, DEHG, EFIH, GHKJ and HILK i.e. 6 in number.

The squares composed of four simple squares are ACIG and DFLJ i.e. 2 in number.

Thus, 6 + 2 = 8 squares will be formed.

Question 7: Ans- B

The figure may be labelled as shown.



The simplest ||gms are ABFE, BCGF, CDHG, EFJI, FGKJ and GHLK. These are 6 in number.

The parallelograms composed of two components each are ACGE, BDHF, EGKI, FHLJ, ABJI, BCKJ and CDLK. Thus, there are 7 such parallelograms.

The parallelograms composed of three components each are ADHE and EHLI i.e. 2 in number.

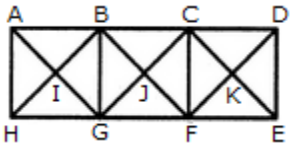
The parallelograms composed of four components each are ACKI and BDLJ i.e. 2 in number

There is only one parallelogram composed of six components, namely ADLI.

Thus, there are 6 + 7 + 2 + 2 + 1 = 18 parallelograms in the figure.

Question 8: Ans- C

The figure may be labelled as shown.



Triangles :

The, simplest triangles are ABI, BGI, GHI, HAI, BCJ, CFJ, FGJ, GBJ, CDK, DEK, EFK and FCK i.e. 12 in number.

The triangles composed of two components each are ABG, BGH, GHA, HAB, BCF, CFG, FGB, GBC, CDE, DEF, EFC and FGD i.e. 12 in number.

The triangles composed of four components each are AGC, BFD, HBF and GCE i.e.4 in number.

Thus, there are 12 + 12 + 4 = 28 triangles in the given figure.

Squares :

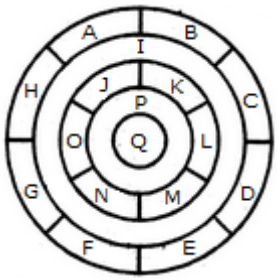
The squares composed of two components each are BJGI and CKFJ i.e. 2 in number.

The squares composed of four components each are ABGH, BCFG and CDEF i.e. 3 in number.

Total number of squares in the figure = 2 + 3 = 5.

Question 9: Ans- A

The figure may be labelled as shown.



The regions A, C, E and G can have the same colour say colour 1.

The regions B, D, F and H can have the same colour (but different from colour 1) say colour 2.

The region 1 lies adjacent to each one of the regions A, B, C, D, E, F, G and H and therefore it should have a different colour say colour 3.

The regions J, L and N can have the same colour (different from colour 3) say colour 1.

The regions K, M and O can have the same colour (different fromthe colours 1 and 3). Thus, these regions will have colour 2.

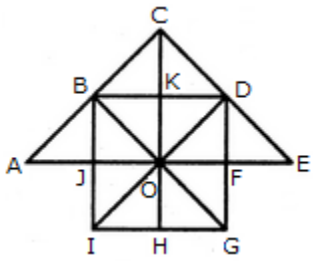
The region P cannot have any of the colours 1 and 2 as it lies adjacent to each one of the regions J, K, L, M, N and O and so it will have colour 3.

The region Q can have any of the colours 1 or 2.

Minimum number of colours required is 3.

Question 10: Ans- D

The figure may be labelled as shown.



Triangles:

The simplest triangles are JBO, BKO, KDO, DFO, FGO, GHO, HIO, IJO, ABJ, BCK, CKD and DEF i.e.12 in number.

The triangles composed of two components each are IBO, BDO, DGO, GIO, ABO, CDO, CBO, CBD and DEO i.e. 9 in number.

The triangles composed of four components each are IBD, BDG, DGI, GIB, ACO and COE i.e. 6 in number.

There is only one. triangle i.e. ACE composed of eight components.

Thus, there are 12 + 9 + 6 + 1 = 28 triangles in the given figure.

Squares:

The squares composed of two components each are BKOJ, KDFO, OFGH and JOHI i.e. 4 in number.

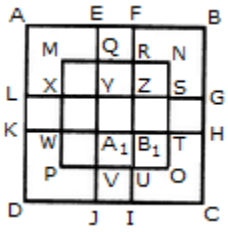
There is only one square i.e. CDOB composed of four components.

There is only one square i.e. BDGI composed of eight components.

Thus, there are 4 + 1 + 1 = 6 squares in the given figure.

Question 11: Ans- D

The figure may be labelled as shown.



The simplest squares are EFRQ, MQYX, QRZY, RNSZ, LXWK, XYA_1W, YZB_1A_1, ZSTB_1, SGHT, WA_1VP, A_1B_1UV, B_1TOU and VUIJ i.e. 13 in number.
The squares having two components each are AEYL, FBGZ, KA_1JD and B_1HCI i.e. 4 in number.
The squares having four components each are MRB_1W, QNTA_1 XZUP and YSOV i.e. 4 in number.
The squares having seven components each are AFB_1K, EBHA_1 LZID and YGCJ i.e. 4 in number.

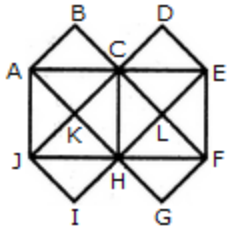
There is only one square i.e. MNOP composed of nine components.

There is only one square i.e. ABCD composed of seventeen components.

There are 13+ 4 + 4 + 4+1 + 1 = 27 squares in the figure.

Question 12: Ans- B

The figure may be labelled as shown.



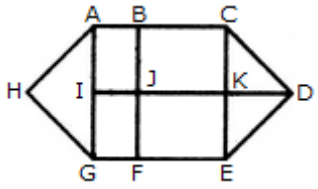
The horizontal lines are AE and JF i.e. 2 in number. The vertical lines are AJ, CH and EF i.e. 3 in number.

The slanting lines are AG, BF, JD, IE, AB, DE, JI and FG i.e. 8 in number.

Total number of straight lines needed to construct the figure = 2 + 3 + 8 = 13.

Question 13: Ans- B

The figure may be labelled as shown.



The simplest rectangles are ABJI, BCKJ, IJFG and JKEF i.e. 4 in number.

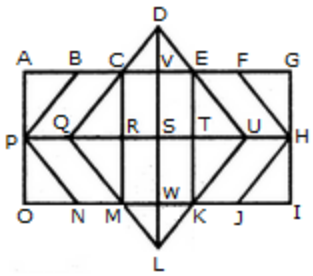
The rectangles composed of two components each are ACKI, BCEF, IKEG and ABFG i.e. 4 in number.

The only rectangle composed of four components is ACEG.

Thus, there are 4 + 4 + 1 = 9 rectangles in the given figure.

Question 14: Ans- A

The figure may be labelled as shown.



Rectangles:

The simplest rectangles are CVSR, VETS, RSWM and STKW i.e. 4 in number.

The rectangles composed of two components each are CETR, VEKW, RTKM and CVWM i.e. 4 in number.

The rectangles composed of three components each are ACRP, PRMO, EGHT and THIK i.e. 4 in number.

The rectangles composed of four components each are CEKM, AVSP,PSWO, VGHS and SHIW i.e. 5 in number.

The rectangles composed of five components each are AETP, PTKO, CGHR and RHIM i.e. 4 in number.

The rectangles composed of six components each are ACMO and EGIK i.e. 2 in number.

The rectangles composed of eight components each are AGHP, PHIO, AVWO and VGIW i.e. 4 in number.

The rectangles composed of ten components each are AEKO and CGIM i.e. 2 in number.

AGIO is the only rectangle having sixteen components.

Total number of rectangles in the given figure

= 4 + 4 + 4 + 5 + 4 + 2 + 4 + 2 + 1 = 30.

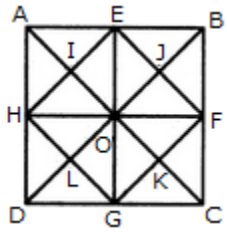
Hexagons:

The hexagons in the given figure are CDEKLM, CEUKMQ, CFHJMQ, BEUKNP and BFHJNP.

So, there are 5 hexagons in the given figure.

Question 15: Ans- A

The figure may be labelled as shown.



Triangles :

The simplest triangles are AEI, EOI, OHI, HAI, EBJ, BFJ, FOJ, OEJ, HOL, OGL, GDL, DHL, OFK, FCK, CGK and GOK i.e. 16 in number.

The triangles composed of two components each are HAE, AEO, EOH, OHA, OEB, EBF, BFO, FOE, DHO, HOG, OGD, GDH, GOF, OFC, FCG and CGO i.e. 16 in number.

The triangles composed of four components each are HEF, EFG, FGH, GHE, ABO, BGO, CDO and DAO i.e. 8 in number.

The triangles composed of eight components each are DAB, ABC, BCD and CDA i.e. 4 in number.

Total number of triangles in the figure = 16 + 16 + 8 + 4 = 44.

Squares :

The squares composed of two components are HIOL, IEJO, JFKO and KGLO i.e. 4 in number.

The squares composed of four components are AEOH, EBFO, OFGC and HOGD i.e.4 in number.

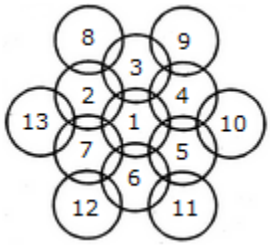
There is only one square EFGH which is composed of eight components.

There is only one square ABCD which is composed of sixteen components.

Total number of squares in the figure = 4 + 4 + 1 + 1 = 10.

Question 16: Ans- C

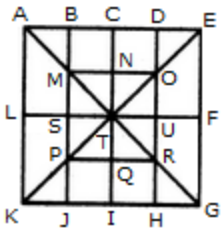
The figure may be labelled as shown.



There are 13 circles in the given figure. This is clear from the adjoining figure in which the centres of all the circles in the given figure have been numbered from 1 to 13.

Question 17: Ans- B

The figure may be labelled as shown.



The simplest squares are BCNM, CDON, PQIJ and QRHI i.e. 4 in number.

The squares composed of two components each are MNTS, NOUT, STQP and TURQ i.e. 4 in number.

The squares composed of five components each are ACTL, CEFT, TFGI and LTIK i.e. 4 in number.

The squares composed of six components each are BDUS and SUHJ i.e. 2 in number.

There is only one square i.e. MORP composed of eight components.

There is only one square i.e. AEGK composed of twenty components.

Total number of squares in the figure = 4 + 4 + 4 + 2+1 + 1 = 16.

Question 18: Ans- C
Logic is 2×1 + 1 = 3, 3 × 2 + 4 =10, 10 × 3 + 9 = 39, 39 × 4 + 16 = 172.... So in place of 38, it should be 39.

Question 19: Ans- D
The logic is 8 × 3 – 5 = 19, 19 × 3 – 5 = 52, 52 × 3 – 5 = 151. So in place of 447, it should be 448.

Question 20: Ans- A
Logic is 4 × .5 = 2, 2 × 1.5 = 3, 3 × 2.5 = 7.5, 7.5 × 3.5 = 26.25 In place of 26.75, it should be 26.25.

Question 21: Ans- C
Logic is 2 × 1 + 1 = 3, 3 × 2 + 4 = 10, 10 × 3 + 9 = 39. Thus the wrong number is 40,it should be 39.

Question 22: Ans- A
Starting from the back
106– 70 = 36, 70- 45 = 25, 45 – 29 = 16, 29 – 20 = 9, 20 – 16 = 4, 16 – 15 = 1. Every difference is perfect square starting from 36 and decreasing. Thus the wrong number is 18, it should be 16.

Question 23: Ans- A

Logic is that first difference is 3, next difference is 6, 9, so next should be 12 & 15. So instead of 40 the term should be 41

Question 24: Ans-D
Logic is 49 + 1 = 50, 50 – 4 = 46, 46 + 9 = 55, 55 – 16 = 39, 39 + 25 = 64. Thus the wrong number is 38, it should be 39.

Question 25: Ans- C
Logic is 6 × 2 + 3 = 15, 15 × 3 – 4 = 41, 41 × 4 + 5 = 169, 169 × 5 – 6 = 839
Thus the wrong number is 179, it should be 169.

Question 26: Ans- E
Logic is 4 × 1.5 = 6, 6 × 2 = 12, 12 × 2.5 = 30, 30 × 3 = 90, 90 × 3.5 = 315, 315 × 4 = 1260. Thus the wrong number is 312.50, it should be 315.

Question 27: Ans- A
35-19 = 16, 19-11 = 8, 11-7 = 4, 7-5 = 2, 5-4 = 1, 4-3.5 = .5 The difference is halved every time. Thus the wrong number is 4.5, it should be 4.

Question 28: Ans:A

The series is,
1*9 - 1 = 8
8*8 + 2 = 66
66*7 - 3 = 459
459*6 + 4 = 2758
2758*5 - 5 = 13785
13785*4 + 6 = 55146

Question 29: Ans- D

The series is,
1 + 02 = 1
2 + 22 = 6
3 + 42 = 19
4 + 62 = 40
5 + 82 = 69
6 + 102 = 106

Question 30: Ans- D

The series is,
252 = 625

262 â€“ 13 = 663
272 + 26 = 755
282 â€“ 39 = 745
292 + 52 = 893
302 â€“ 65 = 835

Question 31: Ans- B

The series is,
7
7 Ã— 3 + 6 = 27
27 Ã— 3 + 12 = 93
93 Ã— 3 + 18 = 297
297 Ã— 3 + 24 = 915
915 Ã— 3 + 30 = 2775
2775 Ã— 3 + 36 = 8361

Question 32: Ans- B

The series is,
112 + 10 = 131
122 + 15 = 159
132 + 20 = 189
142 + 25 = 221
152 + 30 = 255
162 + 35 = 291

Question 33: Ans- C

The series is,
81
81 Ã— (1/3) = 27
27 Ã— (3/3) = 27
27 Ã— (5/3) = 45
45 Ã— (7/3) = 105
105 Ã— (9/3) = 315

Question 34: Ans- C

The series is,
40
40 + 42 = 56
56 + 82 = 120
120 + 122 = 264
264 + 162 = 520
520 + 202 = 920

Question 35: Ans- B

x weeks x days = (7x + x) days = 8x days.

Question 36: Ans- A

The year 2004 is a leap year. So, it has 2 odd days.
But, Feb 2004 not included because we are calculating from March 2004 to March 2005.
So it has 1 odd day only.
The day on 6th March, 2005 will be 1 day beyond the day on 6th March, 2004.
Given that, 6th March, 2005 is Monday.
6th March, 2004 is Sunday (1 day before to 6th March, 2005).

Question 37: Ans- B

We shall find the day on 1st April, 2001.

1st April, 2001 = (2000 years + Period from 1.1.2001 to 1.4.2001)
Odd days in 1600 years = 0
Odd days in 400 years = 0
Jan. Feb. March April
(31 + 28 + 31 + 1) = 91 days 0 odd days.
Total number of odd days = (0 + 0 + 0) = 0
On 1st April, 2001 it was Sunday.
In April, 2001 Wednesday falls on 4th, 11th, 18th and 25th.

Question 38: Ans- B

The year 2006 is an ordinary year. So, it has 1 odd day.
So, the day on 8th Dec, 2007 will be 1 day beyond the day on 8th Dec, 2006.
But, 8th Dec, 2007 is Saturday
S0, 8th Dec, 2006 is Friday.

Question 39: Ans- D
The year 2004 is a leap year. It has 2 odd days.
The day on 8th Feb, 2004 is 2 days before the day on 8th Feb, 2005.
Hence, this day is Sunday

Question 40: Ans- B

The year 2007 is an ordinary year. So, it has 1 odd day.

1st day of the year 2007 was Monday

1st day of the year 2008 will be 1 day beyond Monday

Hence, It will be Tuesday.

Question 41: Ans- D

If the period between the two months is divisible by 7, then that two months will have the same calender .
(a). Oct + Nov = 31 + 30 = 61 (not divisible by 7)
(b). Apr + May + Jun + Jul + Aug + Sep + Oct = 30 + 31 + 30 + 31 + 31 + 30 + 31 = 214 (not divisible by 7)
(c). Jun + July + Aug + Sep = 30 + 31 + 31 + 30 = 122 (not divisible by 7)
(d). Apr + May + June = 30 + 31 + 30 = 91 (divisible by 7

Hence, April and July months will have the same calendar

Question 42: Ans- B

This can be illustrated with an example.
Ex: 1896 is a leap year.The next leap year comes in 1904 (1900 is not a leap year).

Question 43: Ans- A
Weekend means Saturday & Sunday together. In total we have 52 weeks in a year. So there are 52 weekends in a year.
In normal we have **104** Weekend Days.
We know that a Each normal year has 365 days or 52 weeks plus one day, and each week has two weekend days, which means there are approximately 104 weekend days each year.
Whereas in a leap year we have 366 days it adds one more day to the year. And what makes the change is the starting day of the year.

Question 44: Ans- C

We know that,
Odd days --> days more than complete weeks
Number of odd days in 400/800/1200/1600/2000 years are **0.**
Hence, the number of odd days in first 1600 years are 0.
Number of odd days in 300 years = 1
Number of odd days in 49 years = **(12 x 2 + 37 x 1) = 61 days = 5 odd days**
Total number of odd days in 1949 years = **1 + 5 = 6 odd days**
Now look at the year 1950
Jan 26 = 26 days = **3 weeks + 5 days = 5 odd days**
Total number of odd days = **6 + 5 = 11 => 4 odd days**

Odd days :-
0 = sunday ;
1 = monday ;
2 = tuesday ;
3 = wednesday ;
4 = thursday ;
5 = friday ;
6 = saturday

Therefore, **Jan 26th 1950** was **Thursday.**

Question 45: Ans- B

Given year is divided by 4, and the quotient gives the number of leap years.
Here, 100%4 = 25.
But, as 100 is not a leap year => 25 - 1= 24 leap years.

Question 46: Ans- C

Given year is divided by 4, and the quotient gives the number of leap years.
Here, 300%4 = 75.
But, as 100,200 and 300 are not leap years => 75 - 3= 72 leap years.

Question 47: Ans-

Count the number of odd days from the year 2007 onwards to get the sum equal to 0 odd day.

Year	:	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Odd day	:	1	2	1	1	1	2	1	1	1	2	1

Sum = 14 odd days ≡ 0 odd days.

∴ Calendar for the year 2018 will be the same as for the year 2007.

Question 48: Ans-

Let us find the day on 1st July, 2004.
2000 years have 0 odd day. 3 ordinary years have 3 odd days.
Jan. Feb. March April May June July
31 + 29 + 31 + 30 + 31 + 30 + 1
= 183 days = (26 weeks + 1 day) = 1 t .
Total number of odd days = (0 + 3 + 1) odd days = 4 odd days. '
:. 1st July 2004 was 'Thursday',-,-
Thus, 1st Monday in July 2004 _as on 5th July.
Hence, during July 2004, Monday fell on 5th, 12th, 19th and 26th.

Question 49: Ans- C

NOTE :
Repetition of leap year ===> Add +28 to the Given Year.
Repetition of non leap year
Step 1 : Add +11 to the Given Year. If Result is a leap year, Go to step 2.
Step 2: Add +6 to the Given Year.

Solution :
Given Year is 2005, Which is a non leap year.
Step 1 : Add +11 to the given year (i.e 2005 + 11) = 2016, Which is a leap year.
Step 2 : Add +6 to the given year (i.e 2005 + 6) = 2011
Therfore, The calendar for the year 2005 will be same for the year 2011

Question 50: Ans- A

350 days = (350/7=50 weeks) i.e No odd days,
So it will be a Saturday.