



MOCK EXAM - NATA 2017

The Question paper contains Part A (Mathematic and Aptitude) and Part B (Drawings). All the questions are compulsory. No choice is given.

Marks allocation for each section is as follows:

PART –A	Duration: 90 mins	Mathematics	20 Questions X 2 Marks = 40 Marks (OMR Based)
		General Aptitude	40 Questions X 2 Marks = 80 Marks (OMR Based)
PART –B	Duration: 90 mins	Drawing (TWO Sets)	2 Questions X 40 Marks = 80 Marks (A4 Papers)

All the booklets will be served at the beginning in one folder. MCQ answer sheet (OMR) for Part-A will be withdrawn after 90 minutes. It is to be noted carefully that the candidates must fill in as well as bubble in ALL the relevant information including the "Question Booklet No" at the indicated places on OMR Answer Sheet, Drawing Sheets and Attendance Sheet during examination. Questions and all instructions will be available only in English medium.

MATHEMATICS & GENERAL APTITUDE TEST

Only one option is correct and correct response will yield 2 (two) marks. There is no negative marking, but wrong answering will be penalized in case of tie breaking, as elaborated below. Answers to both parts must be provided on same OMR sheet, which is specially designed machine readable response sheet. ANSWERS ARE TO BE MARKED (BUBBLED) USING BLUE/BLACK BALL POINT PEN ONLY ON THE 'OMR ANSWER SHEET'.

DRAWING TEST

Candidate has to attempt two questions within **90 minutes**. The Answer to each question in the 'drawing' paper will be examined by more than one examiner independently and the marks are to be averaged. The primary emphasis in scoring the drawing section is on the candidate's drawing, imagination and observation skills. The candidate's sense of proportion and perspective are also evaluated together with sense for colour and composition.

OTHER INSTRUCTIONS

1. Candidates are not allowed to carry any textual material, printed or written, bits of papers or any other material inside examination Hall.
2. Mobile Phones, Bluetooth devices, Calculators, Slide Rules, Log Tables, Electronic Watches with facilities of Calculator are not allowed in the Examination Hall.
3. Possession of such items during the Examinations may lead to cancellation of candidature.
4. No candidate, without the special permission of the Centre-in-Charge or the invigilator concerned, will leave his/her seat or Examination Hall until the duration of examination for a paper is over.
5. Candidate should not leave the hall without handing over their OMR sheet to the invigilator on duty; this may otherwise lead to cancellation of the concerned paper.
6. It is to be noted carefully that the candidates must write the "Question Booklet No." at the indicated places both on the OMR Answer Sheet and Attendance Sheet during examination. Otherwise his/her OMR Answer sheet in the concerned subject will be cancelled.
7. Candidates shall maintain silence during the examination. Any conversation or gesticulation or disturbance in the examination hall shall be deemed as misdemeanor.
8. If a candidate is found adopting unfair means, his/her candidature shall be cancelled and he/she will be liable to be debarred from taking examination either permanently or for a period according to the nature of offence.

PART – A

DURATION: 90 Minutes

NUMBER OF QUESTIONS: 20 + 40 = 60

MATHEMATICS (Q. Nos. 1 – 20)

(Space for Rough Work)

- The geometric and harmonic means of two numbers x_1 and x_2 are 18 and $16\frac{8}{3}$ respectively. The value of $|x_1 - x_2|$ is
(a) 5 (b) 10 (c) 15 (d) 20
- If the angle of elevation of a cliff at a point A on the ground and a point B, 100 meters vertically at A are α and β respectively, then height of cliff is
(a) $\frac{100 \cot \alpha}{\cot \alpha \cot \beta}$ (b) $\frac{100 \cot \beta}{\cot \alpha \cot \beta}$
(c) $\frac{100 \cot \beta}{\cot \beta - \cot \alpha}$ (d) $\frac{100 \cot \beta}{\cot \alpha + \cot \beta}$
- If $\sin x + \sin^2 x = 1$, then the value of $\cos^2 x + \cos^4 x$ is
(a) 1 (b) 2 (c) 1.5 (d) None of these
- If $\cos A = \frac{1}{2}$, then $\tan 2A =$
(a) $-\frac{1}{\sqrt{3}}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\sqrt{3}$ (d) $-\sqrt{3}$
- Perpendicular distance of the point (3,4,5) from the y-axis is
(a) $\sqrt{34}$ (b) $\sqrt{41}$ (c) 4 (d) 5
- Equation of the sphere concentric with sphere $x^2 + y^2 + z^2 - 4x - 6y - 8z - 5 = 0$ which passes through origin is
(a) $x^2 + y^2 + z^2 - 4x - 6y - 8z = 0$
(b) $x^2 + y^2 + z^2 - 6y - 8z = 0$
(c) $x^2 + y^2 + z^2 = 0$
(d) None of these
- The distance of the point (1,2) from the radical axes of the circles $x^2 + y^2 + 6x - 16 = 0$ and $x^2 + y^2 + z^2 - 2x - 6y - 6 = 0$ is
(a) 1 (b) 2 (c) 3 (d) 4
- If $y = \sqrt{x + \sqrt{x + \sqrt{x + \dots \infty}}}$, then $\frac{dy}{dx} =$
(a) $\frac{1}{2y-1}$ (b) $\frac{1}{\sqrt{1+4x}}$ (c) $\frac{y}{2x+y}$ (d) All of these
- The probability that a non-leap year has 53 Sundays is
(a) 1/7 (b) 2/7 (c) 3/7 (d) 4/7

10. $\int x^3 e^{x^2} dx$ is equal to

- (a) $\frac{1}{2} e^{x^2} (x^2 - 1) + C$ (b) $x^2 (e^{x^2} - 1) + C$
 (c) $\frac{1}{2} x^2 (e^{x^2} - 1) + C$ (d) $\frac{1}{2} (e^{x^2} - 1) + C$

11. A Particle moves in a straight line with velocity given by $\frac{dx}{dt} = x + 1$ (x being the distance described). The time taken by the particle to describe 99 meters is

- (a) $\log_{10} e$ (b) $2 \log_e 10$ (c) $2 \log_{10} e$ (d) $\frac{1}{2} \log_{10} e$

12. Seven digits from the digits 1, 2, 3, 4, 5, 6, 7, 8 and 9 are written in a random order. The probability that this seven-digit number is divisible by 9 is

- (a) $1/9$ (b) $2/9$ (c) $1/3$ (d) $1/5$

13. If three vectors $\vec{a}, \vec{b}, \vec{c}$ are such that $\vec{a} \neq 0$ and $\vec{a} \times \vec{b} = 2\vec{a} \times \vec{c}$, $|\vec{a}| = |\vec{c}| = 1$, $|\vec{b}| = 4$ and the angle between \vec{b} and \vec{c} is $\cos^{-1} \frac{1}{4}$, then $\vec{b} - 2\vec{c} = \lambda\vec{a}$ where λ is equal to

- (a) ± 2 (b) ± 4 (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

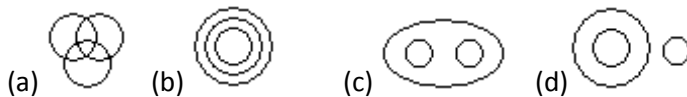
14. A group of 10 items has mean 6. If mean of 4 of these items is 7.5, then find mean of the remaining items

- (a) 10 (b) 12 (c) 5 (d) 3

15. What are the roots of the quadratic equation $7z^2 + 8z + 2 = 0$

- (a) $\frac{-4-\sqrt{7}}{7}$ and $\frac{-4+\sqrt{7}}{7}$
 (b) $+\sqrt{7}$ and $-\sqrt{7}$
 (c) $-4 + \sqrt{7}$ and $-4 - \sqrt{7}$
 (d) No real roots for this equation

16. Which of the following diagrams indicates the best relation between Parents, Mother and Father?



17. A school has 63 students studying Physics, Chemistry and Biology. 33 study Physics, 25 study Chemistry and 26 Biology. 10 Study Physics and Chemistry, 9 Study Biology and Chemistry while 8 study both physics and Biology. Equal numbers study all three subjects as those who learn none of the three. How many study all the three subjects?

- (a) 2 (b) 3 (c) 5 (d) 7

18. If A is a symmetric matrix, then $A^t =$

- (a) A (b) $|A|$ (c) 0 (d) Diagonal matrix

19. $\sec^2\theta - \tan^2\theta + 1 =$

- (a) 1 (b) -1 (c) 2 (d) $\sec^2 2\theta$

20. If $f(x) = x^3 - 2x^2$, then $f(i)$ is equivalent to

- (a) $-2+i$ (b) $2+i$ (c) $2-i$ (d) $-2-i$

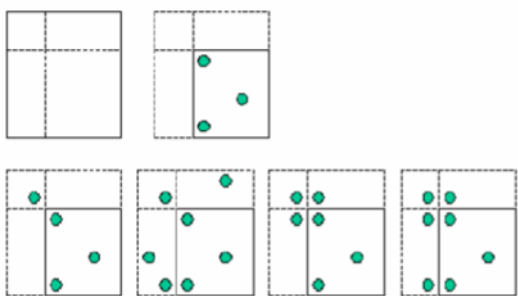
GENERAL APTITUDE (Q. Nos. 21 – 60)

21. Identify the building



- (a) Sydney Opera House
(b) Bahai house of worship
(c) Guggenheim Museum
(d) Temple of Karnak

22. If the paper is folded along the dotted lines and punched as shown in the picture, identify the picture that would appear after unfolding it.



- (a) a (b) b (c) c (d) d

23. The word Incandescence refers to

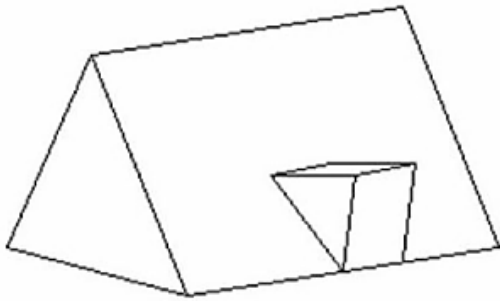
- (a) Light Emission (b) Pollution
(c) Loud Sound (d) Bright light from invisible source

24. Shore Temple is located in

- (a) Ajanta (b) Modhera (c) Tanjore (d) Mahabalipuram

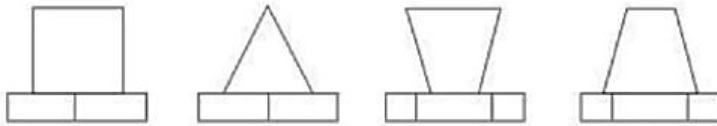
(Space for Rough Work)

25. Identify the number of triangular surfaces



- (a) 2 (b) 3 (c) 4 (d) 5

26. Identify the elevation of the given problem figure from the answer figures given below



- (a) a (b) b (c) c (d) d

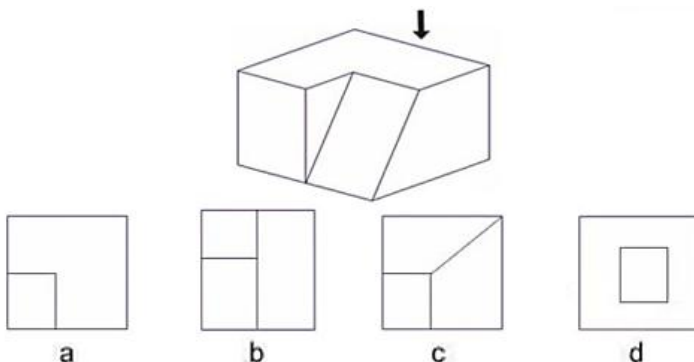
27. Brass is a mixture of

- (a) Copper and Steel (b) Copper and Zinc
(c) Zinc and Tin (d) Copper with high lead content

28. Two walls have the same height and length, of 100 cm and 50 cm respectively. If one is 30 cm thick and the other is 25 cm thick what is the difference in volume between the walls?

- (a) 0.25 cubic meter (b) 0.025 cubic meter
(c) 50 cubic meter (d) 5 cubic meter

29. Identify the correct plan of the following 3D object as shown below

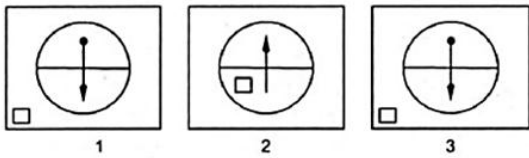


- (a) a (b) b (c) c (d) d

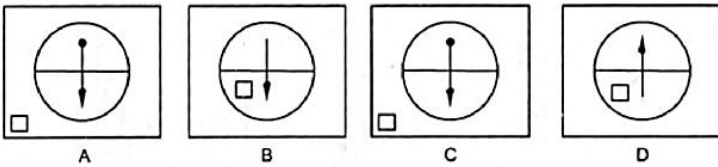
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30. Identify the fourth figure from the given answer figures

Problem Figures



Answer Figures

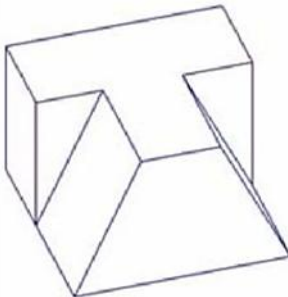


- (a) a (b) b (c) c (d) d

31. The closest meaning to the word outdated is.....

- (a) Recent (b) In Fashion
(c) Perishable (d) Ancient

32. Count the total number of vertical edges in the following figure



- (a) 7 (b) 4 (c) 5 (d) 2

33. If a right angled Isosceles Triangle has its equal sides as 10 units what is the area of the largest square that can be fit into it?

- (a) 5 sq units (b) 25 sq units
(c) 100 sq units (d) 50 sq units

34. If a cube of sides 8 cm is melted and cubes of sides 4 cm are made, how many cubes will you get?

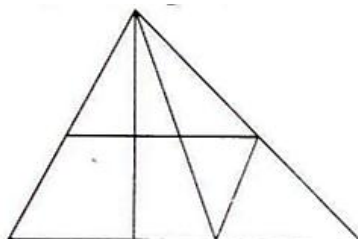
- (a) 4 (b) 8 (c) 2 (d) 16

35. 'Form follows function' was said by

- (a) Frank Owen Gehry (b) F. L. Wright
(c) Louis Sullivan (d) Louis Khan

36. Count the total number of triangles in the given image

- (a) 14
(b) 13
(c) 12
(d) 15



(Space for Rough Work)

37. Identify the type of staircase

- (a) Spiral staircase
- (b) Helical staircase
- (c) Dog-legged staircase
- (d) None of these



38. Which style does Taj Mahal belong to?

- (a) Turkish style
- (b) Mughal style
- (c) Byzantine style
- (d) Gothic style

39. Which city is known as pink city?

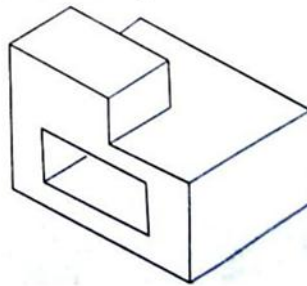
- (a) Delhi
- (b) Jaipur
- (c) Jodhpur
- (d) Rajasthan

40. The word Acoustics relates to

- (a) Water proofing
- (b) Sound proofing
- (c) Air movement
- (d) All of the above

41. Count the number of surfaces in view given below.

- (a) 10
- (b) 13
- (c) 12
- (d) 9



42. An accurate clock shows 8'o clock in the morning. Through how many degrees will the hour hand rotate when the clock shows 2'o clock in the afternoon?

- (a) 144°
- (b) 150°
- (c) 168°
- (d) 180°

43. The ratio of the width of our national flag to its length is

- (a) 3:5
- (b) 2:4
- (c) 2:3
- (d) 3:4

44. Eiffel tower was designed by

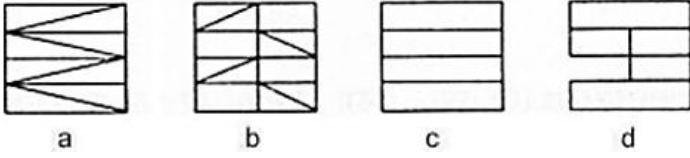
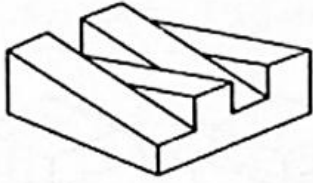
- (a) Edouard Eiffel
- (b) Frank Gehry
- (c) Frank Lloyd Wright
- (d) Gustave Eiffel

45. Identify the material to which the following pattern relates

- (a) Stone
- (b) Wood
- (c) Brick
- (d) Plastic



46. The 3D problem figure shows the view of an object. Identify its top view from among the answer figure.



- (a) a (b) b (c) c (d) d

47. Choose the alternative which is closely resembles the water-image of the following word.

NUCLEAR

(1) RƆAƆLƆU1

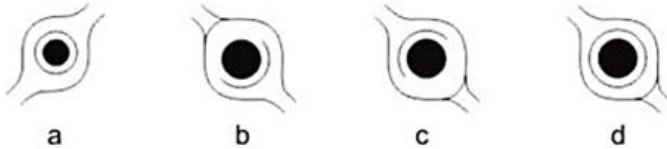
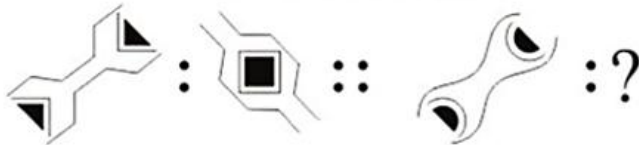
(2) 11C7EVAƆ

(3) 11C7EVAƆ

(4) 11C7EVAƆ

- (a) 1 (b) 2 (c) 3 (d) 4

48. Complete the figure analogy



- (a) a (b) b (c) c (d) d

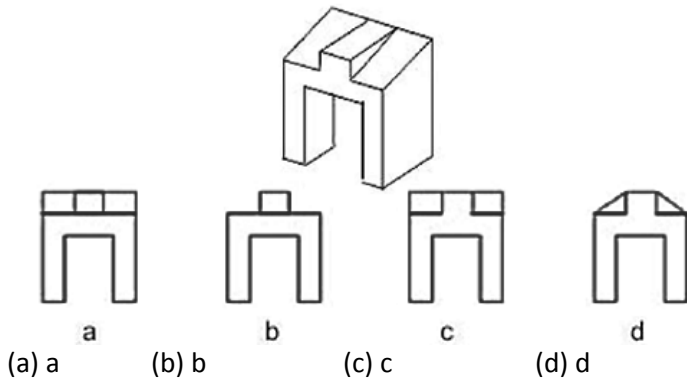
49. Identify the building shown



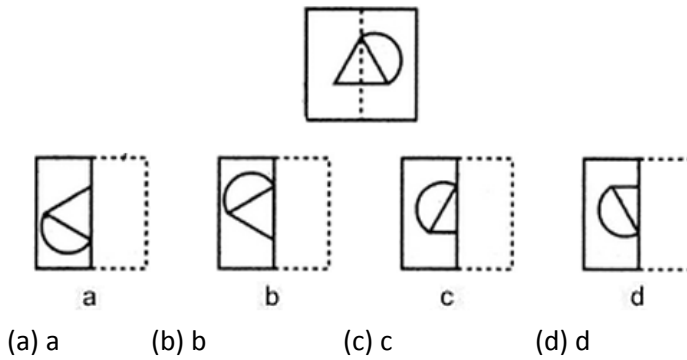
- (a) Basilica of Bom Jesus, Goa
 (b) Se Cathedral, Goa
 (c) St Aloysius Chapel, Managlore
 (d) Jewish museum, Cochin

(Space for Rough Work)

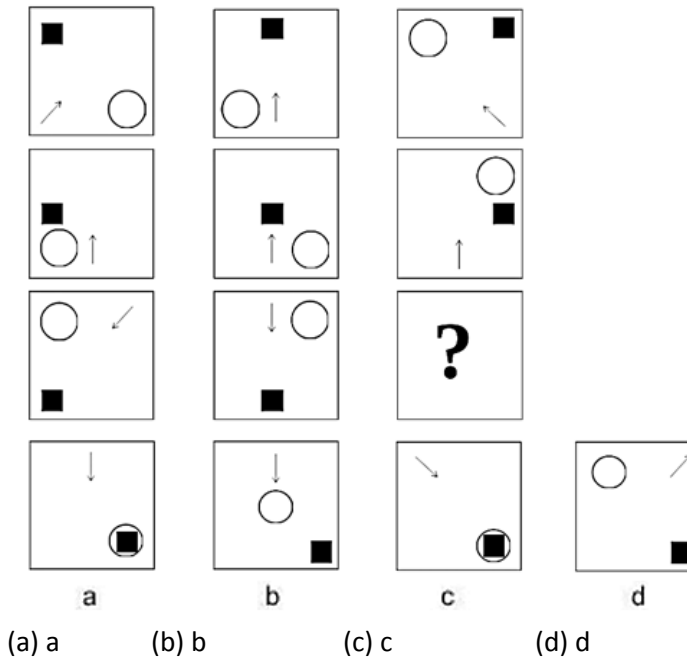
50. Identify the front view of the problem figure from the answer choices given below:



51. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet (X) is folded at the dotted line.



52. Identify the missing square



53. Shyama says that father of Rajiv's father is my father. How is Shyama related to Rajiv?

- a) Sister
- b) Mother
- c) Niece
- d) None of these

54. CALANDER is coded in a code as CLANAEDR. Find the code for CIRCULAR under the same rule.

- (a) LACANDER
- (b) CRIUCALR
- (c) CLANADER
- (d) None of these

55. Starting from a point, a person walked 12 m North, he turned right and walked 10 m, he again turned right and walked 12 m, then he turned left and walked 5 m. How far is he now and in which direction from the starting point?

- (a) 10 m, towards West
- (b) 15 m, towards East
- (c) 10 m, towards East
- (d) 5 m, towards West

56. Find the correct statement related to the following:

| Konark | Madurai | Khajuraho |

- (a) They are famous for their temples
- (b) They were totally destroyed by invaders
- (c) They have some of the very famous forts
- (d) They were capitals of Hindu Kings in ancient times

57. These tiles are better used for



- (a) Bathroom
- (b) Lounge
- (c) Pavement
- (d) Road

58. The purpose of “Minarets” in Mosques is

- (a) Vantage point to call for prayers
- (b) Tallness depicting god’s power
- (c) Considered as connection between earth & sky
- (d) Knowing the direction of Mecca

59. The depression in the brick is called as

- (a) Bin
- (b) Frog
- (c) Duct
- (d) Carnegie



60. Blue is a

- (a) Hot Colour
- (b) Cool Colour
- (c) Secondary Colour
- (d) Neutral Colour

PART – B : DRAWINGS

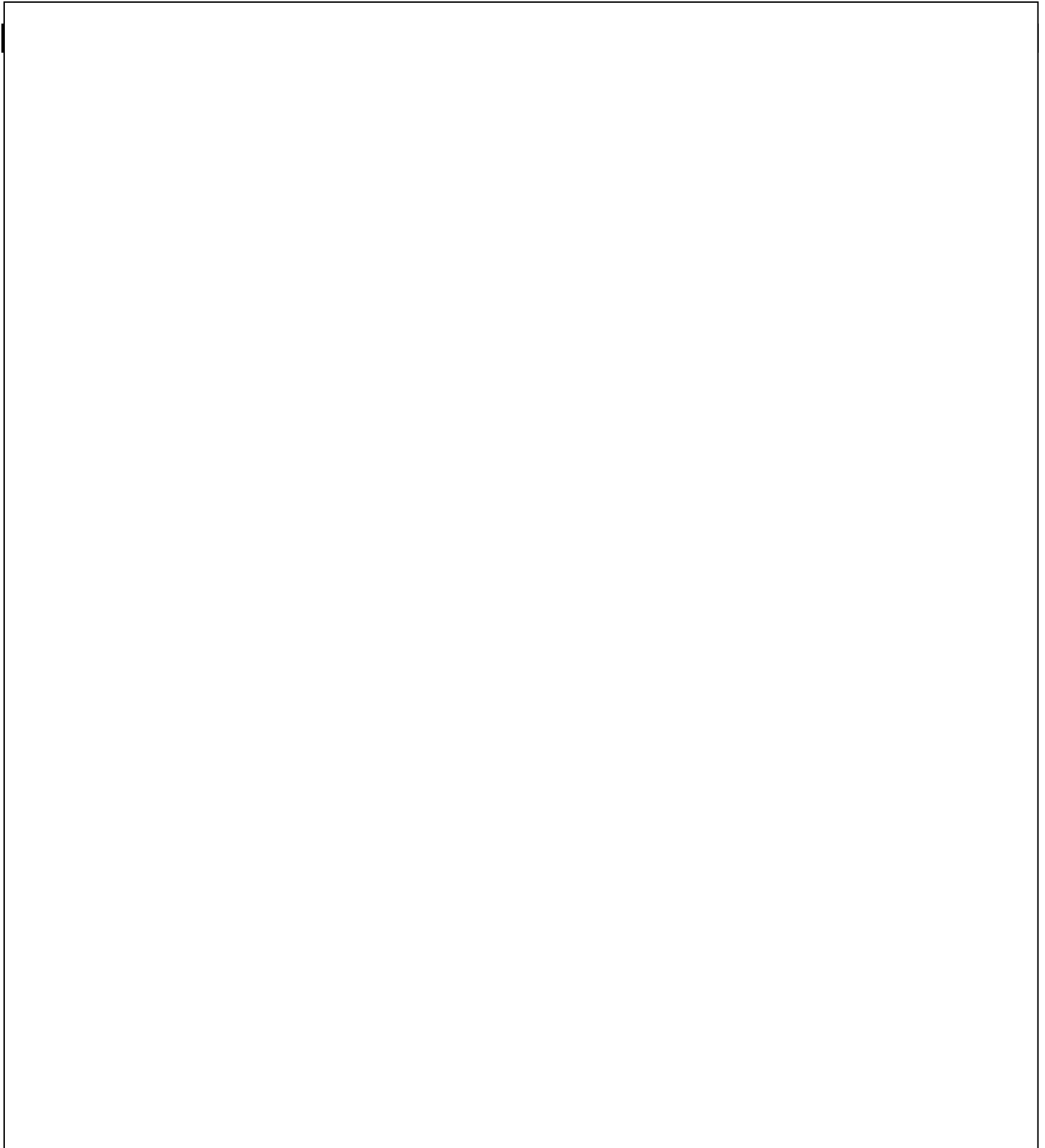
DURATION: 90 Minutes

NUMBER OF QUESTIONS: 2

Question No.1) Imagine you are standing on the 4th floor of an atrium in a shopping mall looking down to the ground floor where you can see some kiosks (stalls without roof): coffee shop, magazine stall etc. You can also see escalators, staircase, capsule lifts, and a water body and seating benches in the center of the atrium with people moving. Draw the view as seen from the top looking down.

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PART – B : DRAWINGS

DURATION: 90 Minutes

NUMBER OF QUESTIONS: 2

Question No. 2) Arrange a bucket, tumbler, an earthen pot, a piece of cloth and rectangular box to make an interesting, stable arrangement like a still life. Draw pencil sketch of the composition showing light and shade in the given space

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