Junior Technical Superintendent – Design

Date: 18th December, 2023   Duration: 2 hour

Instructions

1. This question paper has two parts. Part A and Part B

2. Part A is objective type questions and Part B has descriptive type answers

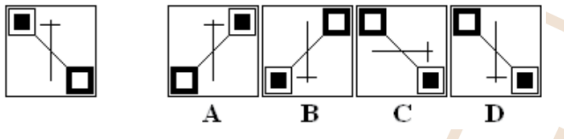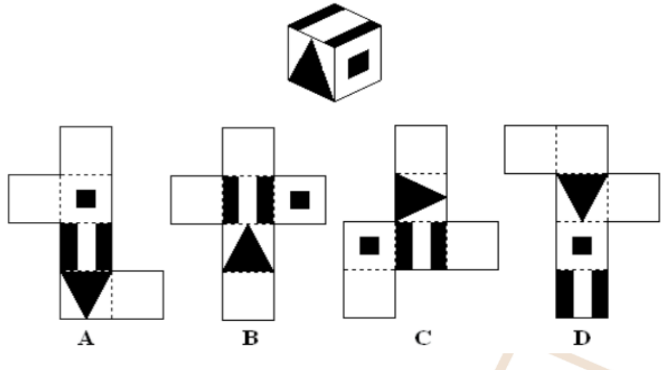3. Part A has to be answered using OMR sheet and Part B has to be answered using the Booklet

Part A:
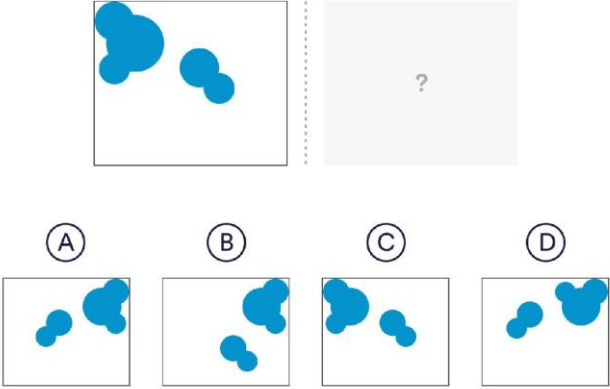
1. Answer all the questions.

2. Each question below carries one mark.

Part B:

1. Answer any one question in full.

2. Each question is for 15 marks

PART A

Sl.No.	Questions	Answers
1	STL file converts curved surfaces into_____. A. Polygons B. Lines C. Surfaces D. None of the above	A
2	Which figure is identical to the first? 	B
3	Which pattern can be folded to make the cube shown? 	B
4	ISO 14000 quality standard is related with A. Environmental management systems B. Automotive quality standards C. Eliminating poor quality D. Customer satisfaction	A

5	Which of the following options is the mirror image of the figure shown below?	D
6	Imagine if the object given below is made of unit cube of 10 cm by stacking. What is the total volume of the of the object. A. 1300 cm^3 B. 160 cm^3 C. 13000 cm^3 D. 16000 cm^3	C
7	Directions for (7-10): Read the passage and answer the questions that follow from (7 -10). "Uncle" said Luke to the old Sean "You seem to be well fed, though I know no one looks after you. Nor have I seen you leave your residence at any time. Tell me how you manage it?"	D

	"Because" Sean replied, "I have a good feed every night at Emperor's orchard. After dark, I go there myself and pick out enough fruits to last a fortnight." Luke proposed to accompany his uncle to the orchard. Though reluctant because of Luke's habit of euphoric exhibition of extreme excitement, Sean agreed to take him along. At the orchard while Sean hurriedly collected the fruits and left, Luke on the other hand at the sight of unlimited supply of fruits was excited and lifted his voice which brought Emperor's men immediately to his side. They seized him and mistook him as the sole cause of damage to the orchard. Although Luke reiterated that he was a bird of passage, they pounded him mercilessly before setting him free. What does "bird of passage"; mean in the context of the given passage? A. There was a bird in the orchard B. Other people stole from the orchard C. Emperor knew him personally D. He did not visit orchard regularly e. Bird's song alerted Emperor's men	
8	Which of the following can be inferred from the passage? A. Luke did not take good care of his uncle B. Emperor was a wicked man C. Lack of self-control had put Luke into trouble D. Luke had a habit of speaking loudly	C
9	How often did Sean visit the orchard? A. Daily morning	D

	B. Weekly C. Once in a month D. Every day after midnight	
10	Choose the word which is most nearly the same in meaning as the word "Reluctant" used in the passage. A. Against B. Resistant C. Opposed D. Disinclined	D
11	The average age of seven boys sitting in a row facing North is 26 years. If the average age of the first three boys is 19 years and the average age of the last three boys is 32 years, what is the age of the boy who is sitting in the middle of the row? A. 24 years B. 28 years C. 29 years D. 31 years	Ans: C Age of the boy sitting in the middle = [26 × 7 – (19 × 3 + 32 × 3)] = (182 – 153) years. = 29 years.
12	If the price of a book is first decreased by 25% and then increased by 20%, then the net change in the price will be A. 5% increase B. 5% decrease C. 10% decrease D. 10% increase	Ans: C Let the original price be Rs. 100. New final price = 120% of (75% of Rs. 100)

		= Rs. ($\frac{120}{100}$ $\times$ $\frac{75}{100}$ $\times 100$) = Rs. 90. $\therefore$ Decrease = 10%.
13	The fire ……………..the huts before the fire brigade came. A. had burnt B. will burn C. has burnt D. burns	A
14	What ISO is one full-stop higher than ISO 300? A. ISO 320 B. ISO 600 C. ISO 400 D. ISO 150	B

15	Identify the correct representation of lighting for this scene, given that the lightning strike is the only light source.	A

16	A number that represents a combination of a camera's shutter speed, aperture, and ISO.
	     A. Aperture
	     B. Rule of thirds
	     C. White Balance
	     D. Exposure Value (EV)
		D

17	Which of these is not a type of camera lens?
	     A. Telephoto
	     B. Prime
	     C. Immersion
	     D. Fish Eye
		C

18	Image P shows a portion of a larger photograph. Some operations have been done on that photograph using an image manipulation software. Image Q shows a portion of the resulting photograph. Identify the option(s) that specifies/specify the correct operations.
	
	   A. Rotate clockwise by 90 degrees, flip horizontally, then rotate clockwise by 90 degrees
	   B. Rotate clockwise by 180 degrees, then flip horizontally
	   C. Rotate clockwise by 180 degrees, then flip vertically
	   D. Rotate clockwise by 90 degrees, flip vertically, then rotate clockwise by 90 degrees
	
	P Q
		B, D

19	Which of these was used to create a bright flash in the early days of photography?
	
	   A. Mercury
	   B. Phosphor
	   C. Copper
	   D. Magnesium
		D

20	Which of the following birds is/are native to (found in) India? Select more than one answer if required.	A, B, D
21	If you have a camera with 1.5 crop factor and use a 200mm f/2.8 lens what would be the equivalent focal length. A. 150mm B. 200mm C. 250mm D. D) 300mm	D
22	Resolution indicates the amount of detail in a digital photo. It is indicated in PPI, which stands for A. Pixels per inch B. Pixels per indicator C. Pins per inch D. Print per inch	A
23	Who made the first advances in color photography? A. James Clerk Maxwell B. Herman Vogel C. Auguste and Louis Lumière D. Ducas du Hauron	A

24	Using tungsten film in daylight will cause a
	
	    A. blue cast
	    B. orange cast
	    C. green cast
	    D. red cast
		A

25	An image strip is cut into 4 pieces. Identify the correct sequence that will complete the image correctly.
	
	    A. Q, R, P, S
	    B. Q, P, S, R
	    C. P, S, Q, R
	    D. R, P, S, Q
	
		D

26	The best shot size to describe this shot is:	B

A. Extreme long shot

B. Long shot

C. Mid shot

D. Close up

| 27 | Kavita is holding a lit torch below her face as she narrates a ghost story to her friends in a dark room. Which option shows the lighting correctly? | B |
| 28 | What format is good for printing an A4 size colour artwork?
    A. RGB
    B. CMYK
    C. RYB
    D. TIFF | B |

29	Which of the following is not a good colour combination for printing a paragraph on an A4 sheet of paper?
	
	    A. Yellow and Black
	    B. Orange and Black
	    C. Navy blue and Black
	    D. Pink and Black
		C

30	You are required to assemble a computer with faster processing speed, select the best combination out of the following.
	
	    A. Graphics card + intel pentium processor + SSD
	    B. Graphics card + AMD Ryzen 3 Series + HDD
	    C. Graphics card + Apple M2 Chip + SSD
	    D. Graphics card + Apple M2 chip + HDD
		C

31	What is the unit for frame rate in monitors
	
	    A. Hertz
	    B. FPS
	    C. Watts
	    D. Joules
		B

32	What is the sum total of the spots on the eleven hidden sides of these four dices?	C
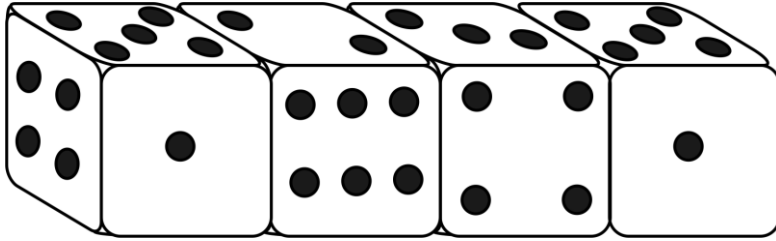
    A. 52

    B. 50

    C. 53

    D. 56

| 33 | Each Block is equal to the sum of the two numbers beneath it. Find out all the missing numbers. A. 2, 12, 32, 39, 52, 59 B. 2, 12, 30, 40, 52, 59 C. 4, 16, 30, 40, 61, 59 D. 4, 16, 32, 39, 61, 59 | B |
| 34 | What number comes next? | A |
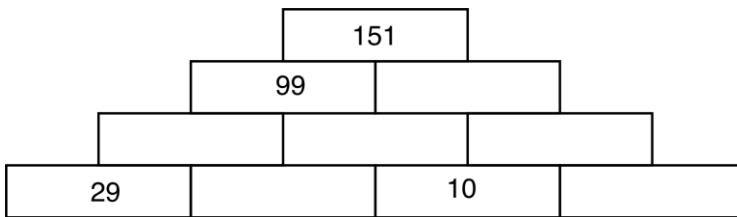
	817599 **957819** **187959** **??????** A. 597189 B. 978159 C. 875919 D. 579189	

35	**Statement 1:** Fitts' Law uses the formula movement time = a + b log2 (distance/size + 1) where a and b are empirically determined constants.
	Statement 2: Studies of keyboard operators have shown that, although the faster operators were up to twice as fast as the others, the slower ones made 10 times the errors.
	  A. Only Statement 1 is True
	  B. Only Statement 2 is True
	  C. Both statements are True
	  D. Both statements are False
		C

36	You receive an email message, and a flag immediately appears in your electronic mailbox to indicate that you have a new message. This indicator is an example of:
	  A. Persistence
	  B. Guidance
	  C. Existence
	  D. None of the above
		A

37	When users are involved in complex tasks, the demand on can be significant.
	
	    A. short-term memory
	    B. shortcuts
	    C. objects that appear on the screen
	    D. all of the mentioned
		A

38	What is an affinity diagram?
	    A. a diagram showing the degree of connection between people in social networks
	    B. a diagram used to show people\s cultural affinities or sense of belonging to groups.
	    C. a diagram that organises individual ideas and insights into a hierarchy showing themes
	    D. a variant of a tag cloud that is generated from think-aloud protocols.
		C

39	Which colour has shortest wavelength
	    A. Yellow
	    B. Violet
	    C. Green
	    D. Red
		B

40	What is the bit rate for transmitting Uncompressed 800X600 pixel color frame with 8 bits/ pixel at 40 frames per second?
	    A. 2.4mbps
	    B. 153.6mbps
	    C. 15.36 mbps
	    D. 24 mbps
		B

41	If a solid octahedron as shown in the figure below, is cut by a plane into two pieces, which of the cross section is not possible? A. Triangle B. Square C. Pentagon D. Hexagon	A
42	What is this shape is called? A. Helix B. Drum C. Mobius Strip D. Klien strip	C

43	Creating everyday sounds in movie post production is called
	    A. Dubbing
	    B. Layback
	    C. Foley
	    D. ADR
		C

44	Gestalt laws are related to	C

	A. Visualization B. Recreation C. Perception D. Imagination	
45	Who is the author of the book "The design of Everyday Things" A. Klaus Kippendorff B. Karl T. Ulrich C. Edward De Bono D. Donold Norman	D

PART B

Answer any one full question (15 marks)

Q1.

  a) Write a short note on the Design guidelines for Additive Manufacturing in FDM process (5 marks)
  b) Develop a form for the juicer taking inspiration from nature. Illustrate with a neat sketch of a Juicer and briefly explain its working principle.   (10 marks)

Q2. Creatively explain the process of making a mobile application for the IIT Hyderabad Alumni group.

Q3. Draw a sequence of 4 frames/ panels from your favourite movie/ series and explain the elements of film making including camera angle, lighting, scene construction, etc.

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