

MENTAL ABILITY

1. If $\vec{a} = \hat{i} + 2\hat{j} + 2\hat{k}$ and $\vec{b} = 3\hat{i} + 6\hat{j} + 2\hat{k}$, then the vector in the direction of \vec{a} and having magnitude as $|\vec{b}|$, is

(A) $7(\hat{i} + 2\hat{j} + 2\hat{k})$	(B) $\frac{7}{9}(\hat{i} + 2\hat{j} + 2\hat{k})$
(C) $\frac{7}{3}(\hat{i} + 2\hat{j} + 2\hat{k})$	(D) None of these

2. Area bounded by $f(x) = (x-1)(x+1)$, x -axis, ordinates $x = 0$, and $x = \frac{3}{2}$ is

(A) $\frac{4}{5}$ sq. units	(B) $\frac{7}{8}$ sq. units	(C) 1 sq. unit	(D) None of these
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3. If $\int \frac{\cos^2 x \sin x}{\sin x - \cos x} dx = \frac{1}{4} \log |\sin x - \cos x| + A + c$. Then A is equal to

(A) $\frac{3}{8}x + \frac{1}{4}\cos 2x + \frac{1}{4}\sin 2x$	(B) $\frac{1}{8}\cos 2x + \frac{1}{8}\sin 2x$
(C) $\frac{1}{2}x + \frac{1}{4}\sin 2x + \frac{1}{8}\cos 2x$	(D) $\frac{3}{8}x + \frac{1}{4}\sin 2x + \frac{1}{8}\cos 2x$

4. A function f such that $f'(a) = f''(a) = \dots = f^{2n}(a) = 0$ and f has a local maximum value b at $x = a$, if $f(x)$ is

(A) $(x-a)^{2n+2}$	(B) $b-1-(x+1-a)^{2n+1}$
(C) $b-(x-a)^{2n+2}$	(D) $(x-a)^{2n+2}-b$

5. The function $f(x) = \sin |x|$ is

(A) Continuous for all x	(B) Continuous only at certain points
(C) Differentiable at all points	(D) None of these

6. If $y = [(\tan x)^{\tan x}]^{\tan x}$, then $\frac{dy}{dx}$ at $x = \frac{\pi}{4}$ is equal to
 (A) 1 (B) 2 (C) 0 (D) None of these
7. Domain of the function $f(x) = \sin^{-1}(2x^2 + 3x + 1)$ is
 (A) $(-1, 1)$ (B) $(-\infty, \infty)$ (C) $\left[\frac{3}{2}, 0\right]$ (D) None of these
8. A and B are two events. Odds against A are $2 : 1$. Odds in favour of $A \cup B$ are $3 : 1$. If $x \leq P(B) \leq y$, then the ordered pair (x, y) is
 (A) $\left(\frac{5}{12}, \frac{3}{4}\right)$ (B) $\left(\frac{2}{3}, \frac{3}{4}\right)$ (C) $\left(\frac{1}{3}, \frac{3}{4}\right)$ (D) None of these
9. The value of θ for which $\theta = \tan^{-1}(2 \tan^2 \theta) - \frac{1}{2} \sin^{-1}\left(\frac{3 \sin 2\theta}{5 + 4 \cos 2\theta}\right)$, is/are
 (A) $2n\pi$ (B) $n\pi, n\pi + \frac{\pi}{4}, n\pi + \tan^{-1}(-2)$
 (C) $n\pi - \frac{\pi}{4}$ (D) None of these
10. Value of θ lying between $\theta = 0$ and $\theta = \frac{\pi}{2}$ and satisfying $\begin{vmatrix} 1 + \sin^2 \theta & \cos^2 \theta & 4 \sin 4\theta \\ \sin^2 \theta & 1 + \cos^2 \theta & 4 \sin 4\theta \\ \sin^2 \theta & \cos^2 \theta & 1 + 4 \sin 4\theta \end{vmatrix} = 0$
 is
 (A) $\frac{7\pi}{24}$ (B) $\frac{5\pi}{24}$ (C) $\frac{9\pi}{24}$ (D) $\frac{\pi}{24}$

LOGICAL AND ANALYTICAL REASONING

11. Eight students Amit, Misha, Chaya, Dhruv, Ekta, Farah, Kabir and Mohit are planning to enjoy car racing. There are only two cars and following are the conditions:
- I. One car can accommodate maximum five and minimum four students.
 - II. Amit will sit in the same car in which Dhruv is sitting but Mohit is not in that same car.
 - III. Misha and Chaya can't sit in the same car in which Dhruv is sitting.
 - IV. Farah will sit in the car of four people only along with Amit and Ekta but certainly not with Kabir.

If Mohit and Kabir are sitting in the same car, who are other two students sitting in the same car ?

- (A) Misha and Chaya (B) Misha and Dhruv
 (C) Chaya and Dhruv (D) Chaya and Amit

12. If \times stands for 'addition'; $<$ stands for 'subtraction'; $>$ stands for 'multiplication'; \div stands for 'division'; $-$ stands for 'equal to'; \div stands for 'greater than'; $=$ stands for 'less than'; then which one of the given alternatives is correct ?

- (A) $8 < 4 \times 3 - 3 \times 2 \times 1$ (B) $8 > 4 < 3 - 3 > 2 < 1$
 (C) $8 \times 4 < 3 \div 3 < 2 < 1$ (D) $8 + 4 \times 3 \div 3 > 2 \times 1$

13. If POLITICS is coded as OPILITSC, how will ARTICLES be coded in that language ?

- (A) RAITLCES (B) RAITLCSE (C) ARITLCSE (D) RAITLECS

14. Examine the following statements :

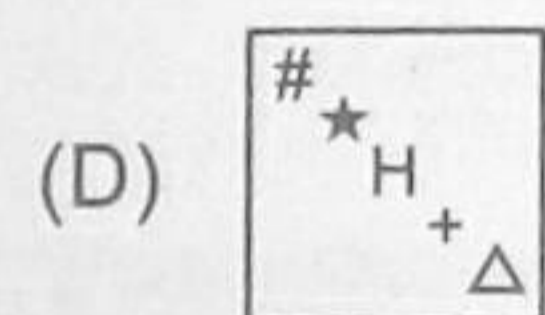
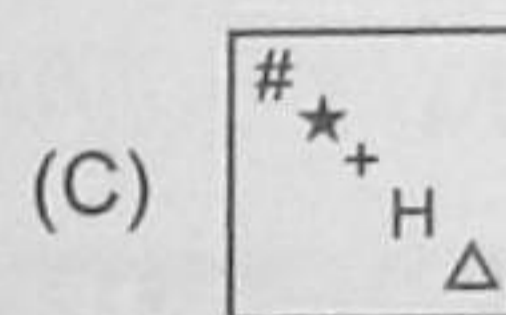
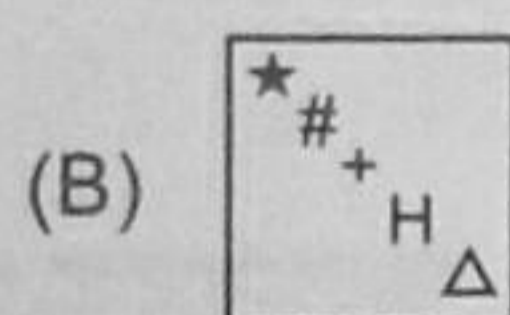
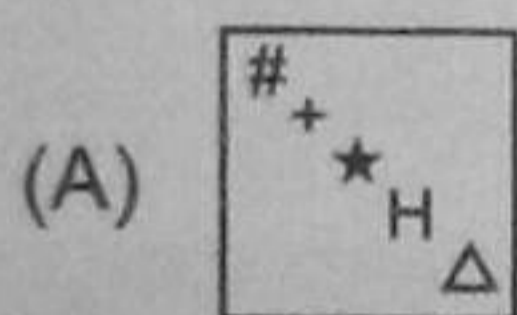
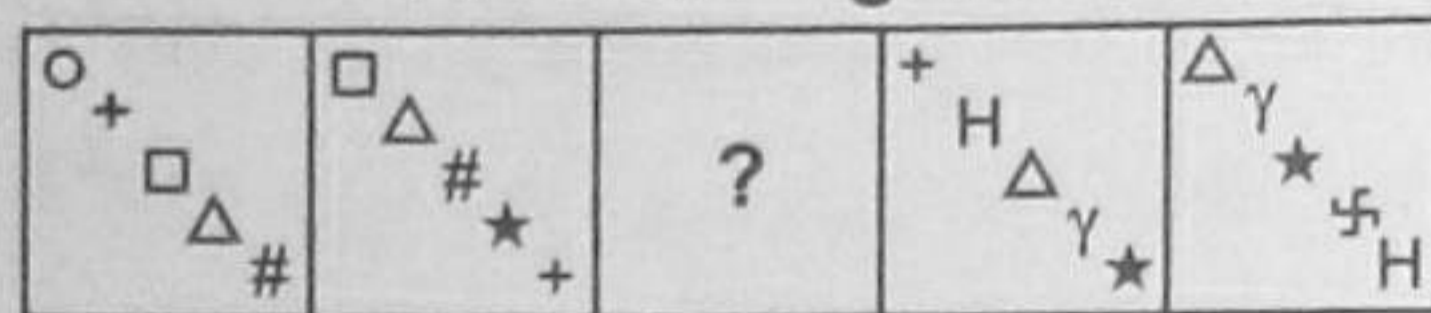
- I. Either A and B are of the same age or A is older than B.
 II. Either C and D are of the same age or D is older than C.
 III. B is older than C.

Which one of the following conclusions can be drawn from the above statements ?

- (A) A is older than B (B) B and D are of the same age
 (C) D is older than C (D) A is older than C

15. Select a figure which would replace the sign of question mark (?), so that the series established by the problem figures can be continued.

Problem Figures



16. Select the mirror image of the combination given below.

1 9 6 5 I N D O P A K

- (A) K A P O D N I 5 6 9 1
 (C) K A P O D N I 9 6 1

- (B) K 1 9 6 5 I N D O P A
 (D) K A P O D N I 9 6 1

17. The town X is located on Green lake. The town Y is West of X. Z is East of Y but West of X. W is East of V but West of Z and Y. If all the towns are at the same distances which town is the farthest West?

- (A) X (B) W (C) V (D) Y

18. If 'P@Q' means 'P is the mother of Q'; 'P\$Q' means 'P is the husband of Q'; 'P#Q' means 'P is the sister of Q'; 'P*Q' means 'P is the son of Q'; then which of the following is definitely true for F#J*T\$R@L?

- (A) L is the brother of F (B) F is the sister of L
 (C) F is the brother of J (D) L is the brother of J

19. Select a figure from the options in which the fig. (X) is embedded.

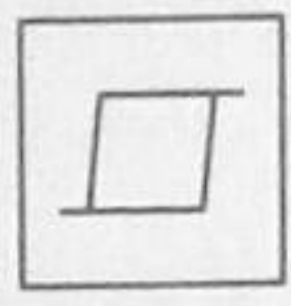
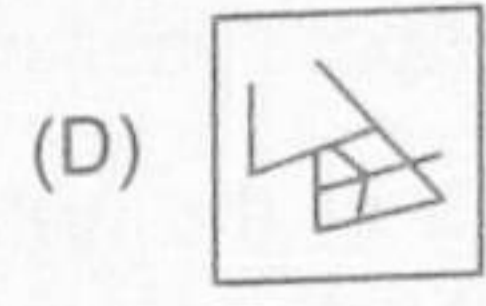
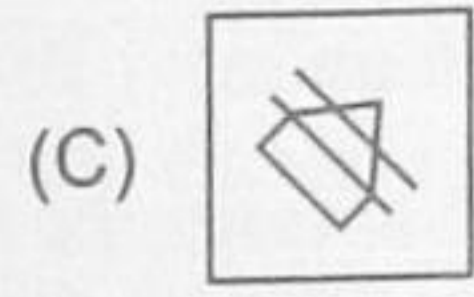
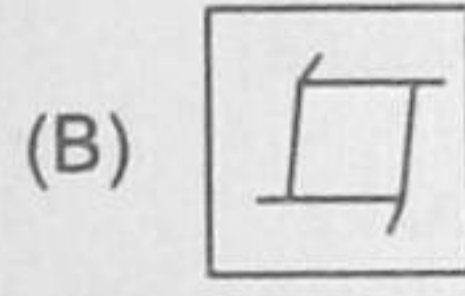
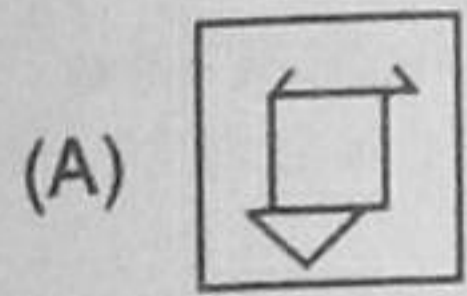
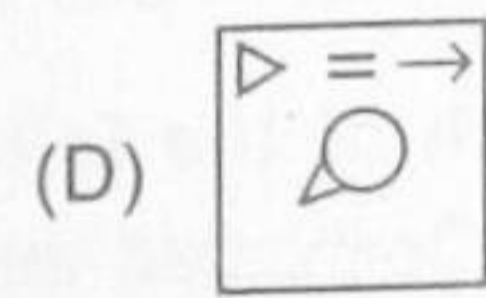
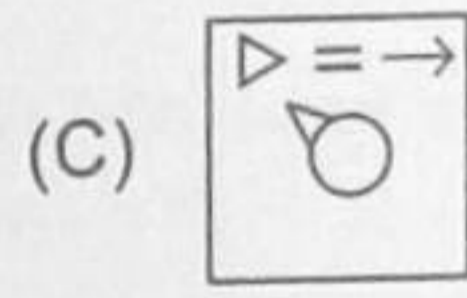
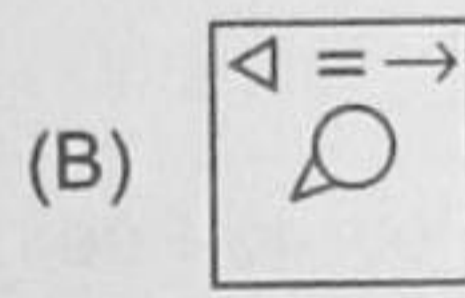
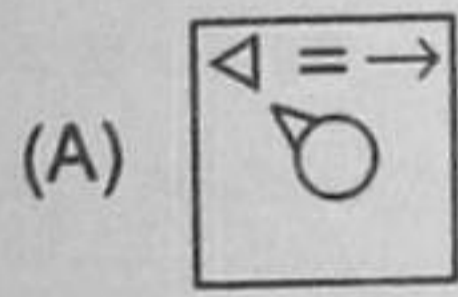
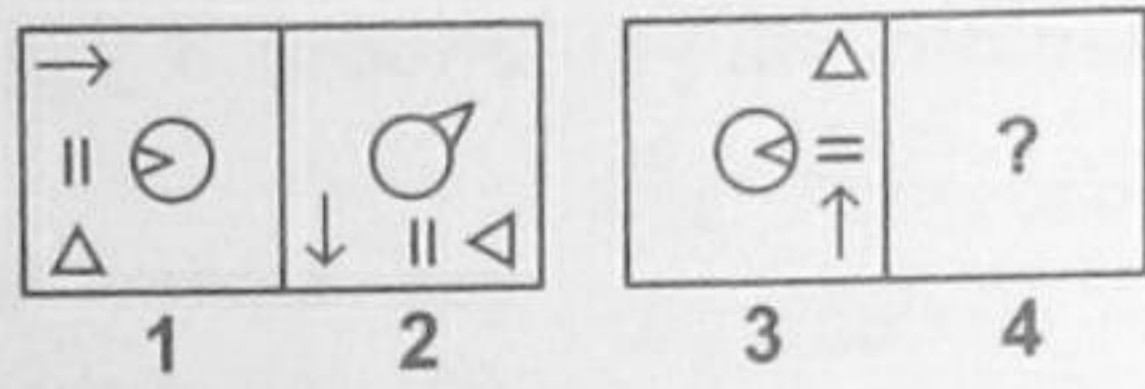


Fig. (X)



20. Figures (1) and (2) bears certain relationship. Similarly, figure (4) bears the same relationship to figure (3). Select a figure from the options which would replace the sign of question mark (?).

Problem Figures



COMPUTERS AND INFORMATION TECHNOLOGY

21. What happens when we try to compile the class definition in the following code snippet?

```
class shape { };
class square : protected shape { };
```

- (A) It will not compile because class body of shape is not defined.
- (B) It will not compile because class body of square is not defined.
- (C) It will not compile because a class cannot be protectedly inherited from other class.
- (D) It will compile successfully.

22. _____ is the other name of Microsoft's Project Natal i.e., a motion sensor gaming console.

- (A) Kindle
- (B) Kinect
- (C) Wii
- (D) KALQ

23. In DBMS, _____ model describes data at the conceptual and view levels.

- (A) Record based
- (B) Hierarchical
- (C) Object based
- (D) Network

24. In DBMS _____ model, the records are organized as collection of trees rather than arbitrary graphs.

- (A) Network
- (B) Hierarchical
- (C) Relational
- (D) Both (A) and (C)

25. Find the minimized form of the following function.

$$x'y'z + x'yz + xy'$$

(A) $xy + x'z$

(B) $x'z + xy'$

(C) $x'z' + yz$

(D) $xz' + x'y$

26. In Ms-PowerPoint, while typing in a placeholder _____ option button automatically decreases the size of the font to fit it in the placeholder.

(A) Text

(B) Autofont

(C) Autofit

(D) Autofit Text

27. Which of the following statements is INCORRECT?

(A) Analog signals are continuous in nature.

(B) Digital signals have discrete amplitude levels.

(C) You can easily remove noise from analog signals added during transmission.

(D) Digital signal is a sequence of voltage pulses in binary form.

28. Which of the following medium will you choose if you want to send analog signal for transmission?

(A) Coaxial cable

(B) Optical fiber cable

(C) Twisted pair cable

(D) All of these

29. Which of the following is a type of LAN?

(A) Dedicated server

(B) Peer-to-Peer

(C) Zero-slot

(D) All of these

30. _____ virus does not stay in the memory after the host program is closed.

(A) Resident

(B) Non-Resident

(C) Multipartite

(D) Real Time

31. _____ is an automatic protection provided by most of the anti viruses. This monitors system for suspicious activities such as spyware, virus etc.

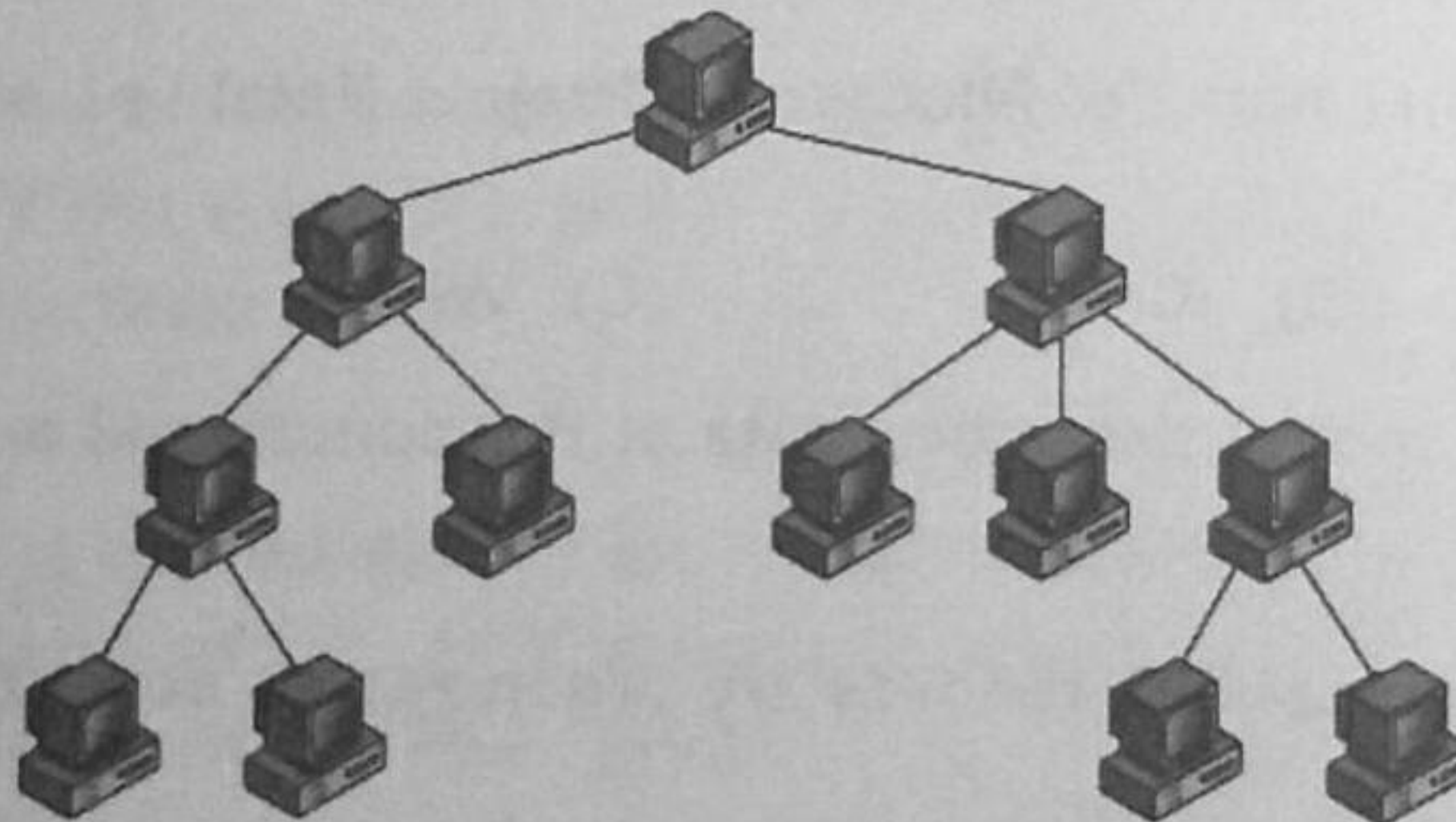
(A) Signature based protection

(B) Heuristics protection

(C) Rootkit detection

(D) Real Time protection

32. Identify the following topology.



(A) Tree

(B) Bus

(C) Mesh

(D) Star

33. Which of the layers in OSI model has sub-layer?
 (A) Transport Layer (B) Data Link Layer
 (C) Physical Layer (D) Presentation Layer
34. _____ is a software that can fetch all packets out of the network and process them for any misuse.
 (A) IP spoofing (B) Network Packet Sniffers
 (C) Hacking (D) Cracking
35. _____ works on the data link layer.
 (A) Router (B) Bridge
 (C) Modem (D) Hub
36. In Ms-Word, _____ restricts a document so that it can be opened and/or changed only by specific individuals.
 (A) Document Inspector (B) Permission
 (C) Digital signature (D) Markup
37. Dual of $(X + Y) \cdot (\bar{X} + \bar{Z}) + (Y \cdot \bar{Z})$ is _____.
 (A) $XY + \bar{X}\bar{Z} + YZ$ (B) $XY + \bar{X} + \bar{Z} + Y\bar{Z}$
 (C) $XY + \bar{X}\bar{Z} \cdot (Y + \bar{Z})$ (D) $X + Y + \bar{X}\bar{Z} + Y\bar{Z}$
38. In database, _____ is ability to modify the scheme followed at the internal level without affecting the scheme followed at conceptual level.
 (A) Logical Data Independence (B) Physical Data Independence
 (C) Cardinality (D) Both (A) and (C)
39. In DBMS, _____ is a binary operation that yields a new relation which has a degree equal to the sum of the degrees of the two relations under consideration.
 (A) Cardinality (B) Project operation
 (C) Cartesian Product (D) Set Intersection operation
40. Which of the following are used for security at server level?
 (A) Intrusion Detection System (B) Encryption
 (C) Firewalls (D) Both (A) and (C)
41. ICANN stands for _____.
 (A) International Corporation for Automated Names and Number
 (B) Internet Corporation for Assigned Names and Numbers
 (C) International Committee for Assigned Names of Network
 (D) Internet Committee for Alotted Names and Number

42. You see 504 error on your webpage when _____.
- (A) The server cannot process the request due to system overload
 - (B) The service did not responded within the time frame that gateway had assigned
 - (C) Result of problem in the code or program being called
 - (D) The requested file was not found

43. Which of the following are the five built-in functions provided by SQL?
- (A) SUM, AVG, MIN MAX, MULT
 - (B) COUNT, SUM, AVG, MAX, MIN
 - (C) SUM, AVG, MULT, DIV, MIN
 - (D) SUM, AVG, MIN, MAX, NAME

44. Which of the following are types of Parser in XML?
- (A) Organized and non-organized
 - (B) Validating and non-validating
 - (C) Attributable
 - (D) None of these

45. Select the INCORRECT line number, in contrast to XML.

- 1. <xml version = 1.0?>
- 3. <to>ABC<\to>
- 5. <\note>

- 2. <note>
- 4. <from>XYZ<\from>

- (A) 2
- (B) 1
- (C) 4
- (D) 5

46. In Windows Movie Maker, a video effect determines that how _____.

- (A) One clip or picture ends and other begins
- (B) Your movie plays from one audio track to another
- (C) Your name appears on the title of the movie
- (D) A video clip, picture or title displays in your movie

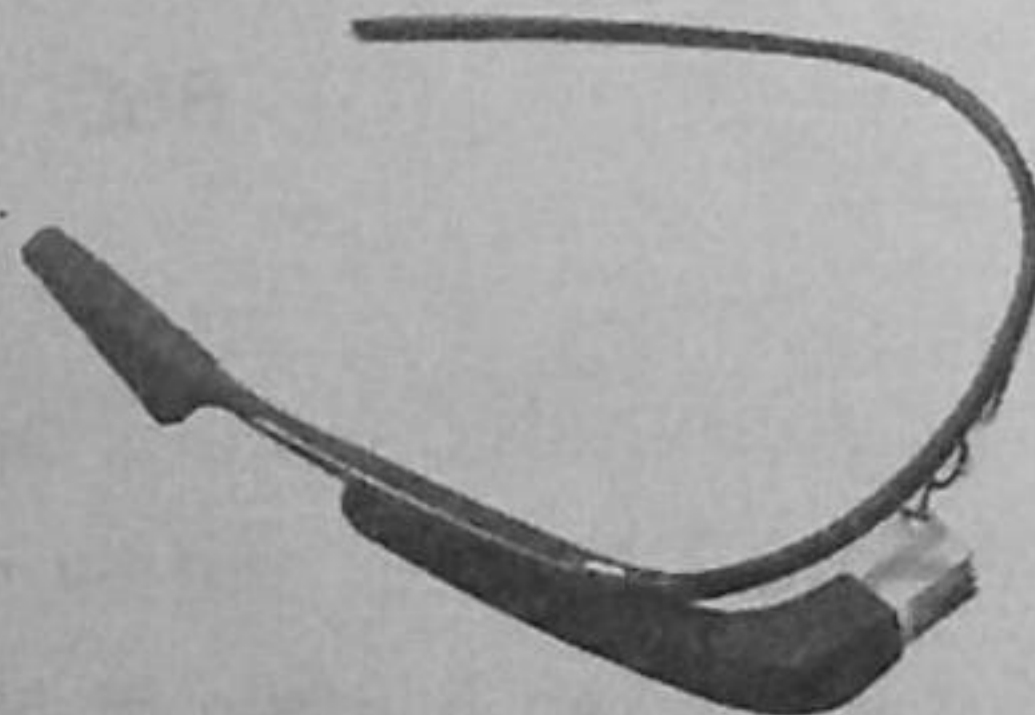
47. RFC 1087 was defined by _____ in _____.

- (A) ICANN, Jan 1990
- (B) IETF, Feb 1980
- (C) IAB, Jan 1989
- (D) IAB, Apr 1991

48. In Windows Movies Maker, _____ view of the workspace displays the sequence of your clips.

- (A) Timeline
- (B) Outliner
- (C) Storyboard
- (D) Sorter

49. Identify the given image.



- (A) Google Glasses
- (B) Simulator
- (C) i Goggles
- (D) Wii

50. In Windows Movie Maker, the section heading that allows you to add transitions, effects, titles etc. in the task pane is _____.

(A) Finish movie

(B) Create movie

(C) Edit movie

(D) Animate movie