UGC NET - COMPUTER SCIENCE

MOCK TEST PAPER

- **PAPER - I**   *This paper contains 50 objective type questions.*

     Each question carries 2 marks.

     Attempt all the questions.

- **PAPER - II**   *This paper contains 100 objective type questions.*

     Each question carries 2 marks.

     Attempt all the questions.

- *Pattern of questions*   :   *MCQs*
- *Total marks (PAPER I & II)*   :   *300*
- *Duration of test*   :   *Paper I - 1 Hour*

                                 :   *Paper II - 2 Hours*

PAPER-I

1. In union budget 2018-19, the government announced setting up Ekalavya Model Residential School, Consider the following statement about it.

    (i) It will provide the best quality education to the tribal childrenin their own environment

    (ii) by 2022 it will be build in every block with more than 50% ST population.

    (iii) It will focus on preserving local art and culture.

    Which of the statement given above is/are correct?

    Select the answer using the codes given below:

    (1) i and ii only   (2) ii and iii only

    (3) iii only   (4) i, ii and iii

2. Which of the following statement is correct about the RISE by 2022 announced by government in Union budget 2018-19?

    (1) It is to step up investments in Education.

    (2) It is to step up investments in health.

    (3) It is to step up investments in telecommunication.

(4) It is to step up investments in sports.

3. Which country to host the World Sustainable Development Summit – 2018 ?

   (1) South Africa   (2) Nepal

   (3) Brazil   (4) India

4. Which HRD Ministry-appointed committee is drafting new National Education Policy (NEP)?

   (1) Ram Shanker Kureel committee

   (2) K Kasturirangan committee

   (3) V G S Rathore committee

   (4) KJ Alphonse committee

5. With reference to Paris agreement on climate change, consider the following statements :

   I. It was signed by 195 nations in Dec 2015 at Paris

   II. The main aim is to keep a global temperature rise this century well below 3 degrees Celsius

   III. It further aims to drive efforts to limit the temperature increase even further to 1.5 degrees Celsius above pre-industrial levels

   Which of the above statements are correct ?

   (1) I and II   (2) II and III

   (3) I, II and III   (4) I and III

6. Which of the following statements are correct?

   a. Parliament cannot alter the name and territory of J&K without the consent of the State legislature

   b. The Union shall have the power to suspend the State Constitution on the ground of failure to comply with the directions given by the Union.

   c. No proclamation of Emergency can be made by the President under Article 352 on the ground of "internal disturbance" in J&K without the concurrence of J&K Government

   Which of the above statements are correct ?

   (1) (a) and (b)   (2) (b) and (c)

   (3) (a) and (c)   (4) (a), (b), (c)

7. **Assertion (A):** Global warming is the increase in Earth's near-surface air and

ocean temperatures.

Reason (R): The greenhouse effect is when water and carbon dioxide absorb outgoing infrared radiation, increasing the planet's temperature

Choose the correct code:

(1) Both (A) and (R) are correct   (2) Both (A) and (R) are incorrect,

(3) (A) is true and (R) is true   (4) (A) is false and (R) is true

8.   Which of these pairs are correctly matched ?

a. The Vienna Convention : Protection of Ozone Layer

b. Montreal Protocol   : Substances that Deplete the Ozone Layer

c. The Minamata Convention : Lead

(1) a only

(2) a and b only

(3) c only

9.   Representation of the People (Amendment and Validation) Bill, 2013, brought two key changes. These changes were :

• Even if a person is prohibited from voting due to being in police custody or in jail, he can file nomination for an election.

• Definition of "disqualified" in the Act has been amended. disqualification has to be due to conviction for certain specified offences and can be on no other ground.

• Anyone in prison or on the lawful custody of the police (other than preventive detention) is not entitled to vote.

Select the correct answer using the codes given below.

(1) I and ii only   (2) I and iii only

(3) ii and iii only   (4) I, ii, iii

10.   Match List – I and List – II and identify the correct code:

a. World Health Day   i.16th September

b. World Population Day   ii. 1st December

c. World Ozone Day   iii. 11th July

d. World AIDS Day   iv. 7th April

Codes:

	a	b	c	d
(1)	i	ii	iii	iv

(2)	iv	iii	i	ii
(3)	ii	iii	iv	i
(4)	iii	iv	ii	i

11. **Assertion (A):** Water Borne diseases are largely caused by micro-organisms present in human or animal waste

Reason (R): Typhoid fever is a Water Borne diseases.

Choose the correct code:

(1) Both (A) and (R) are correct

(2) Both (A) and (R) are incorrect,

(3) (A) is true and (R) is true

(4) (A) is false and (R) is true

12. Which of the following statements regarding the meaning of research are correct

a. Research refers to a series of systematic activity or activities undertaken to find out the solution of a problem

b. It is a systematic, logical and an unbiased process wherein verification of hypothesis data analysis, interpretation and formation of principles can be done

c. It is an intellectual enquiry or quest towards truth

d. It leads to enhancement of knowledge

(1) (a), (b) and (c)   (2) (b), (c) and (d)

(3) (a), (c) and (d)   (4) (a), (b), (c) and (d)

13. Below are given two seat – research methods (Set-I) and data collection tools (Set-II). Match the two sets and indicate your answer by selecting the correct code:

A Experimental method   i Using primary secondary sources

B Ex post-facto method   ii Questionnaire

C Descriptive survey method   iii Standardized tests

D Historical method   iv Typical characteristics tests

Codes:

A B C D

1. ii i iii iv

2. iii iv ii i

3. ii iii i iv

4. ii iv iii i

14. Consider the following statements :

a. Teaching is the stimulation, guidance, direction and encouragement of learning

b. Good teaching is as much about passion as it is about reason

c. Good teaching is also about bridging the gap between theory and practice

Which of the above statements are correct ?

(1) a and b

(2) b and c

(3) a and c

(4) a, b and c

15. Consider the following statements about NITI Aayog :

a. The National Institution for Transforming India, also called NITI Aayog, was formed via a resolution of the Union Cabinet on January 1, 2015

b. NITI Aayog fosters Cooperative Federalism

c. The President is its Chairman

Which of the statements given above is/are correct ?

(1) a and b only

(2) b and c only

(3) a and c

(4) a, b and c

16. Imagine you are working in an educational institution where people are of equal status. Which method of communication is best suited and normally employed in such a context?

(1) Horizontal communication

(2) Vertical communication

(3) Corporate communication

(4) Cross communication

17. An unsolicited e-mail message sent to many recipients at once is a

(1) Worm

(2) Virus

(3) Threat

(4) Spam

18. If the proposition 'All thieves are poor' is false, which of the following propositions can be claimed certainly to be true?

Propositions :

(1) Some thieves are poor.

(2) Some thieves are not poor.

(3) No thief is poor.

(4) No poor person is a thief.

19. It is communication of feelings, emotions, attitudes, and thoughts through body movements / gestures / eye contact, etc." which type of communication is this?

(1) Oral communication

(2) Written communication

(3) Non verbal communication   (4) None

Questions20-24 Study the follow ing graph carefully to answer the given questions.
PRODUCTION OF TWO COMPANIES A AND B (IN CRORE UNITS) OVER THE GIVEN YEARS
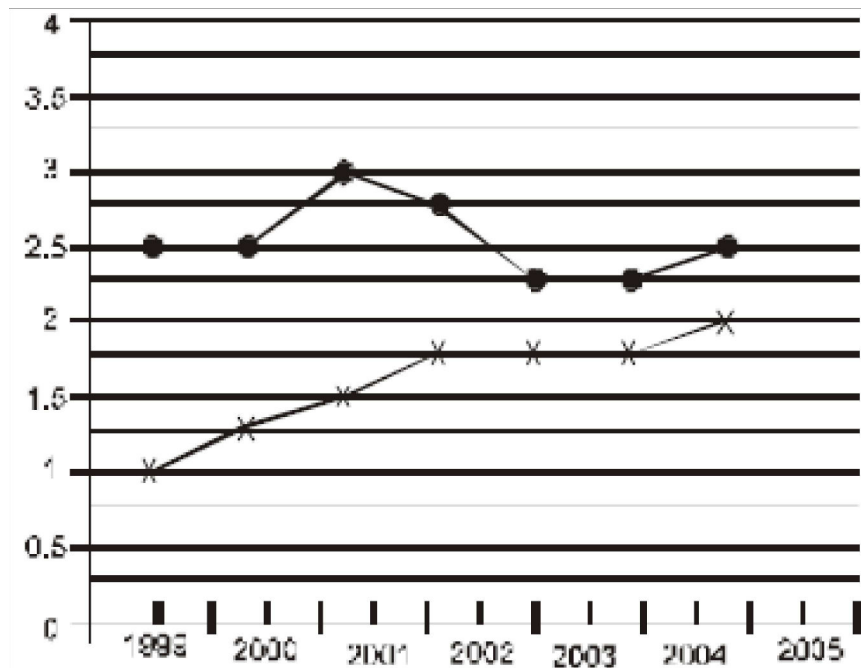
20. For Company A, how much is the percent increase in production in 2000 from 1999?
    (1) 0.25   (2) 2.5
    (3) 25   (4)12.5

21. How many units is the total production of Company A for the given years?
    (1) 9 crores   (2) 17.75 crores
    (3) 12.25 crores   (4) 11 crores

22. What is the difference in units produced by the two companies in 1999?
    (1) 1,50,000,000   (2) 15,00,00,000
    (3) 15,00,000   (4) 15,000

23. How many units is the approximate average production of Company B for the given years?
    (1) 3 crores   (2) 2.55 crores
    (3) 2.75 crores   (4) 2.25 crores

24. In which year did both the companies have no change in production from the previous year?

(1) 2000   (2) 2002

(3) 2003   (4) 2004

25. Which of the follow ing collection techniques were used as the primary research methods for this study?

(1) Qualitative   (2) Quantitative

(3) Both (1) and (2)   (4) None

26. Which of the follow ing problems was India faced with after Independence ?

(1) Military attack from a country across the border.

(2) Lack of coordination between the Central and State Governments.

(3) Improper coordination of various Government policies

(4) Increasing the production from a very low level

27. Which of the follow ing issues was not appropriately realized by the Central Government.

(1) Ethnic diversity of the people

(2)A national language for the country

(3) Implementation of the formulated policies

(4) Centre -State relations

28. Why was central economic planning found to be difficult?

(1) Multiplicity of States and Union Territories

(2) Lack of coordination in different Government departments

(3) Autonomy given to the States in certain matters

(4) Lack of will in implementing land reforms

29. Why was the linguistic reorganization of the State accepted?

(1) The States were not cooperating with the Central Government

(2) Non- Congress Governments in the States demanded such a reorganization of the States

(3) No common national language emerged

(4) Strong pressure from the States was exerted on the Central Government to

create such States

30. Which, according to the passage, can be cited as an exercise in democratic practice in India before Independence?

(1) The handing over of pow er by the British to India

(2) The Indianisation of the Indian Civil Service

(3) A neutral role played by the Army

(4) None of the above

31. The information to be collected in survey method are related to

(1) Present Position

(2) Aims of the research

(3) The attainment of aim of research

(4) All of the above

32. One of the essential characteristics of research is

(1) Sensitivity   (2) Generalizability

(3) Usability   (4) Replicability

33. Identify the main Principle on which the Parliamentary System operates.

(1) Responsibility of Executive to Legislature

(2) Supremacy of Parliament

(3) Supremacy of Judiciary

(4) Theory of Separation of power

34. Match list I with list II and select the correct f rom the code given below :

List I (Institutions)	List II (Locations)
1. Indian Veterinary Research Institute	i. Pune
2. Institute of Armament Technology	ii. Izat Nagar
3. Indian Institute of Science	iii. Delhi
4. National Institute for Educational Pannesi and Administrators	vi. Bangalore

(1) 1-ii, 2-i, 3-iv, 4-iii   (2) 1-ii, 2-iv, 3-ii, 4-iii

(3) 1-ii, 2-iii, 3- I, 4- iv   (4) 1-iv, 2-iii, 3-ii, 4-i

35. The prime minister of India is appointed from _____

(1) The leading Party in Lok Sabha

(2) The Leading Party in Rajya Sabha

(3) The leading party in Lok Sabha and Rajya Sabha combined

(4) None of the above

36. The study of interrelations between Organism and their environment is called___

(1) Biosphere   (2) Ecology

(3) Synecology   (4) Autecology

37. The term ICT is now also used to refer to the convergence of

(1) Audio visual   (2) Telephone netw ork

(3) Both (1) and (2)   (4) None

38. Fossil Fuels include

(1) Oil   (2) Natural Gas

(3) Coal   (4) All of the above

39. Noise in excess of _____ is called noise pollution

(1) 40-65 db   (2) 60-70 db   (3) 80-100 db   (4) None of the above

40. Effectiveness of teaching depends on ____

(1) Handwriting of Teacher   (2) Speaking ability of Teacher

(3) Qualification of the Teacher   (4) Subject Understanding of the Teacher

41. The participation of students w ill be maximum if ____ method is used for teaching.

(1) Text Books   (2) Discussion Method

(3) Conference Method   (4) Lectures

42. In following questions, number series is given. One of the numbers in each series is w rong. After searching wrong number find the correct number in its place.

510, 254, 126, 64, 30, 14, 6

(1) 252   (2) 62

(3) 130   (4) 9

43. Which reasoning deter mines whether the truth of a conclusion can be determined for that rule, based solely on the truth of the premises?

(1) Deductive   (2) Inductive

(3) Abductive   (4) All

44. Insert the missing number or letter from among the given alternatives.
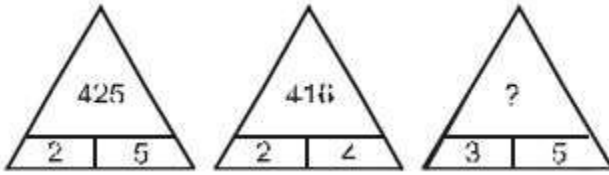
(1) 140   (2) 280

(3) 875   (4) 925

45. In the following question assuming the given statements to be true, find out which of the two assumptions I and II given below them is/are definitely true give answer as.

(1) Only assumption I is implicit

(2) Only assumption II is implicit

(3) Either I or II is implicit

(4) Neither I nor II is implicit

(E) Both I and II are implicit

Statement: The State government has decided to appoint four thousand primary school teachers during the next financial year.

Assumptions:

I. There are enough schools in the state to accommodate four thousand additional pr imary school teachers.

II. The eligible candidates may not be interested to apply as the government may not finally appoint such a large number of primary school teachers.

46. What is the latest write-once optical storage media?

(1) Digital paper   (2) Magneto-optical disk

(3) WORM disk   (4) CD- ROM disk

47. Which of the following identifies a specific web page and its computer on the Web?

(1) Web site   (2) Web site address

(3) URL   (4) Domain Name

Direction (48-49) In the following figure, rectangle, square, circle and triangle represents the regions of wheat gram, maize and rice cultivation respectively. On the basis of the figure, answer the follow ing question
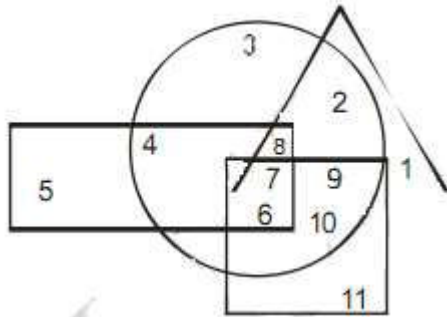
48. Which of the area is cultivated for w heat and maize only?
    (1) 8   (2) 6   (3) 5   (4) 4
49. Which of the area is cultivated for maize only?
    (1) 10   (2) 2
    (3) 3   (4) 4
50. Pointing to a photograph. Bajpai said, " He is the son of the only daughter of my brother." How Bajpai is related to the man in the photograph?
    (1) Nephew   (2) Brother
    (3) Father   (4)Maternal Uncle

PAPER II

1. What is the simplification of the following Boolean expression in a Product-Of-Sum form?

$$Out = (A+B+C+\bar{D})(A+B+\bar{C}+D)(A+\bar{B}+C+\bar{D})(A+\bar{B}+\bar{C}+D)$$
$$(\bar{A}+\bar{B}+\bar{C}+D)(\bar{A}+B+C+\bar{D})(\bar{A}+B+\bar{C}+D)$$

(A) Out = (A+B+ NOT(3)) (A+NOT(3)+ D) (C+NOT(4))

(2) Out = (A+B) (A+NOT(4)) (B+NOT(3)+D)

(3) Out = (B+C+ NOT(4)) (A+C+ NOT(4)) (NOT(3)+D)

(4) Out = (A+NOT(2)+D) (C+D) (B+NOT(3)+D)

2. What is the appropriate form for the given k-map?

(1) F(W,X,Y,Z) = Óm (0,3,4,6,8,10,11,12,14)

(2) F(W,X,Y,Z) = Óm (0,2,5,6,8,10,13,14,15)

(3) F(W,X,Y,Z) = Óm (1,2,5,6,8,9,11,14,15)

(4) F(W,X,Y,Z) = Óm (1,2,3,7,9,10,11,14,15)

3. How many fibres are required by a unidirectional and bidirectional ring respectively, to support their working traffic?

(1) 1 and 1   (2) 2 and 1

(3) 2 and 2   (4) 1 and 2

4. Find odd one out related to transmission media cables?

(1) Basic rate ISDN can transmit data at a rate of 512 kilobits per second on an existing local telephone line.

(2) A T1 line is a dedicated telephone connection of 24 channels.

(3) A T1 channel can be configured to carry either voice or data traffic.

(4) Cable modems provide high-speed transmission over cable TV lines and are shared by many users.

5. What does a metric of 16 hops represent when using RIP?

(1) Number of hops to the destination

(2) Destination unreachable

(3) Number of routers

(4) Bandwidth

6 If the 8085 adds 87H and 79H, specify the contents of the accumulator and the status of the S, Z, and CY flag?

(1) 10H; S =1, Z = 0, CY = 1

(2) 01H; S =0, Z = 0, CY = 1

(3) 00H; S =0, Z = 1, CY = 1

(4) 11H; S =1, Z = 1, CY = 0

7. If the stack pointer is initialized with (4FEB) H, then after execution of Push operation in 8085 microprocessor, the Stack Pointer shall be

(1) 4FEA   (2) 4FEC   (3) 4FE9   (4) 4FED

8. If an input and output port can have the same 8-bit address how does the 8085 differentiate between the ports?

(1) The input port requires the WR and the output port requires the RD signal

(2) The input port requires the RD and the output port requires the WR signal

(3) The input port and output port requires low I/O

(4) None of the above

9. Consider the grammar given below

$$E \rightarrow E+E \mid E^*E \mid E\text{-}E \mid E/E \mid E^{\wedge}E \mid (E) \mid id$$

Assume that + and . have the same but least precedence, * and / have the next higher precedence but the same precedence and finally ^ has the highest precedence. Assume + and . associate to the left like * and / and that ^ associates to the right. Choose the correct statement with respect to relations for the ordered pairs (^,^) , (-,-) , (+,+) , (*,*) in the operator precedence table constructed for the grammar

(1) all <   (2) all >   (3) <,>,=,<   (4) <,>,>,>

10. P, Q, R are three languages. If P and R are regular and if PQ=R, then

(1) Q has to be regular   (2) Q cannot be regular

(3) Q need not be regular　　　　(4) Q has to be a CFL

11.　Which of the following conversion is not possible (algorithmically)?

(1) regular grammar to context-free grammar

(2) nondeterministic FSA to deterministic FSA

(3) nondeterministic PDA to deterministic PDA

(4) nondeterministic TM to deterministic TM

12.　The following are the set of processes with their respective CPU burst time (in milliseconds).

Processes CPU	Burst time
P1	10
P2	5
P3	5

What will be the average waiting time if the process arrived in the order: P1, P2 & P3?

(1) 6.82 unit　　　　　　　　　　(2) 7.56 unit

(3) 8.33 unit　　　　　　　　　　(4) 9.97 unit

13.　Match the following:

Column I	Column II
p) time sharing	(1) Program first executed when a computer is turned on
q) process	(2) Part of an operating system that communicates with the user
r) bootstrap	(3) Technique that allows multiprocessing on a computer with a single CPU
s) shell	(4) Activity of executing a program

　　(p)　(q)　(r)　(s)

(1) (4), (1), (2), (3)

(2) (3), (4), (1), (2)

(3) (2), (3), (4), (1)

(4) (1), (4), (2), (3)

14.　In Priority Scheduling a priority number is associated with each process. The CPU is allocated to the process with the highest priority. The problem of starva-

tion is resolved by which of the following?

(1) Terminating the process.   (2) Aging

(3) Mutual Exclusion   (4) Semaphore

15. Which of the following does not support for Page-Stealer process?

(1) It is a kernel process that makes room for the incoming pages

(2) It is created by the Kernel at the system initialization and invokes it through-out the lifetime of the system.

(3) Kernel locks a region when a process faults on a page in the region, so that page stealer cannot steal the page, which is being faulted in.

(4) All are correct.

16. If you type 'cat prog.c' at a UNIX command prompt, which of the following sequences of system calls would be invoked?

(1) The shell calls fork(); the child process calls exec() and the parent calls wait()

(2) The shell calls fork(); the child calls wait() and the parent calls exec()

(3) The shell calls exec() and then wait() and then fork()

(4) The shell calls wait() then fork(), creating a child which calls exec()

17. Which of these describe the activity of a contract review?

(1) Evaluation of the target market

(2) Evaluation of the development risks

(3) Evaluation of the weather during the software development.

(4) Evaluation of the staff's personal background

18. Insufficient identification is a

(1) Technology-related problem

(2) Process-related problem

(3) People-related problem

(4) Product-related problem

19. Five nines of reliability refers to

(1) Five software engineering practices that must be in place and assessed at level 9 in order to ensure reliability

(2) A product that is operational 99.999% of the time

(3) A product that fails one time in 10,000 days

(4) A product which fails only five times in 99,999 days

20. Which of the following is not a static testing tool?

(1) Static analyzers   (2) Code inspectors

(3) Output comparators   (4) Standard enforces

21. Match the following-

Column I	Column II
p) Disparate data	(i) Archive data
q) Non volatile data	(ii) Level of detail
r) Data granularity	(iii) Query and analysis
	(iv) Production data

        (p) (q) (r)

(1) (i), (iv), (ii)

(2) (iii), (ii), (iv)

(3) (ii),   (i), (iii)

(4) (iv), (iii), (ii)

22. Select the options due to which credit theft is impossible with smart card

I. Key to unlock encrypted information required

II. No physical signature on the card

III. There is no external account number on the card

IV. Smart cards can be used with only acquainted merchants

(1) Only I and II   (2) Only II and III

(3) Only I and III   (4) Only I and IV

23. Match the following:

Column I	Column II
p) FAT12	(i) 1996 (Windows 95 OSR2)
q) FAT16	(ii) 1977 (Microsoft Disk BASIC)
r) FAT32	(iii) 1988 (MS-DOS 4.0)

        (p) (q) (r)

(1) (iii), (i), (ii)

(2) (iii), (ii), (i)

(3) (ii), (iii), (i)

(4) (i), (iii), (ii)

24. Which macro sends an output message to the debug window of compiler:

(1) COUT   (2) FOUT   (3) TRACE   (4) Display

25. In windows 95 which tool is used to kill errant hidden processes?

(1) Task Manager   (2) Process Manager

(3) PVIEW   (4) Explorer

26. Which question corresponds best to the following query?

SELECT CID, CDUR - 1,' = PRICE' FROM COURSES ORDER BY 2

(1) Select three columns from the COURSES table, of which the third one has a constant value, i.e. " = PRICE". Leave an empty line after every second line.

(2) Select two columns from the COURSES table, the second one gets as title " = PRICE".Sort the data according to the second column, in ascending order.

(3) Select three columns from the COURSES table, of which the third one has a constant value i.e. " = PRICE". Sort the data according to the second column, in ascending order.

(4) Select two columns from the COURSES table, of which the second one has a constant value, i.e. " = PRICE". Sort the data according to the second column, in ascending order.

27. A modification to the database expressed in terms of a view must be translated to the –

(1) Actual relation in the conceptual model of the database

(2) Queries in the actual database

(3) Relations of all the views of that database

(4) Need not be translated and the view of a database accommodates the modification

28. If D1, D2 ..... Dn are domains in relational model then the relation is a table which is a subset of ---

(1) { D1, D2 ..... Dn}

(2) D1 x D2 x .... Dn

(3) D1 U D2 U .....Dn

(4) Maximum { D1, D2 ..... Dn}

29. If the in order and pre order traversal of a binary tree are DBFEGHAC and ABDEFGHC respectively then, the post order traversal of that tree is

(1) DFGABCHE   (2) FHDGEBCA

(3) DFHGEBCA   (4) CGHFEDBA

30. "n" elements of a queue are to be reversed using another queue. The number of "ADD" and "REMOVE" required to do so is,

(1) 2*n   (2) 4*n   (3) n   (4) the task cannot be done

31. Prim's algorithm is a method available for finding out the minimum cost of a spanning tree. Its time complexity is given by:

(1) O(n*n)   (2) O(n logn)   (3) O(n)   (4) O(1)

32. Maximum number of children in a node in a B-tree of order "m" is:

(1) m   (2) m/2-1   (3) m/2+1   (4) m/2

33. A has one share in a lottery in which there is 1 prize & 2 blanks; B has three shares in a lottery in which there are 3 prizes & 6 blanks: compare the probability of A's success to that of B's success as

(1) 7 : 16   (2) 16 : 7   (3) 6 : 14   (4) 14 : 6

34. The following 'C' code : -

```
# include < stdio.h >
main ( )
{ file * FP ;
FP = fopen ( " trial " , " r " );
    }
```

FP points to :-

(1) First character in the file

(2) A structure which contains a ' char ' pointer to the first character in the file.

(3) Name of the file.

(4) None.

35. The eccentricity of node labeled 5 in the graph shown below is:

(1) 6   (2) 7   (3) 8   (4) 5
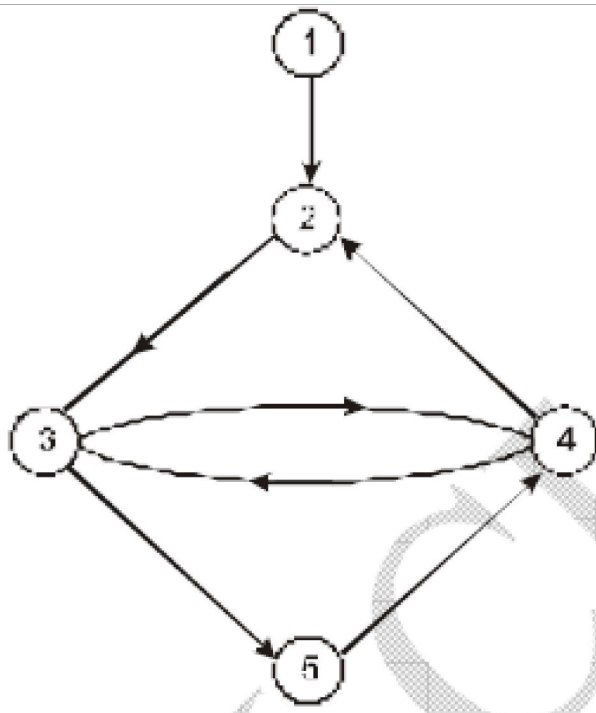
36.   Let M be a 3 × 3 , adjacent matrix corresponding to a given graph of 3 nodes labeled 1, 2, 3. If entry (1, 3) in M3 is 2, then the graph could be

A.

B.

C.

D.
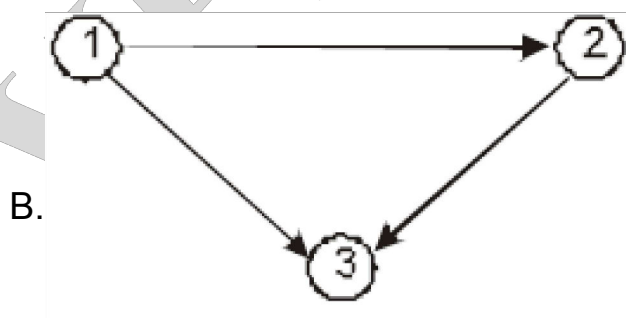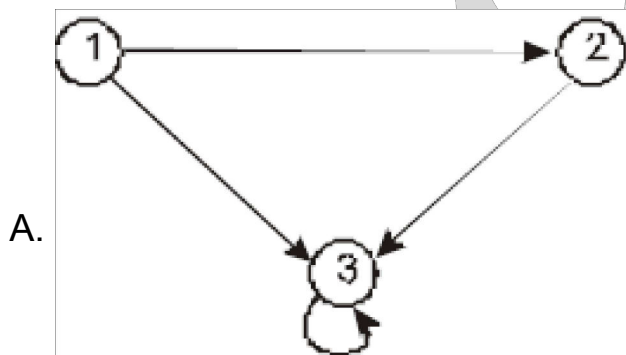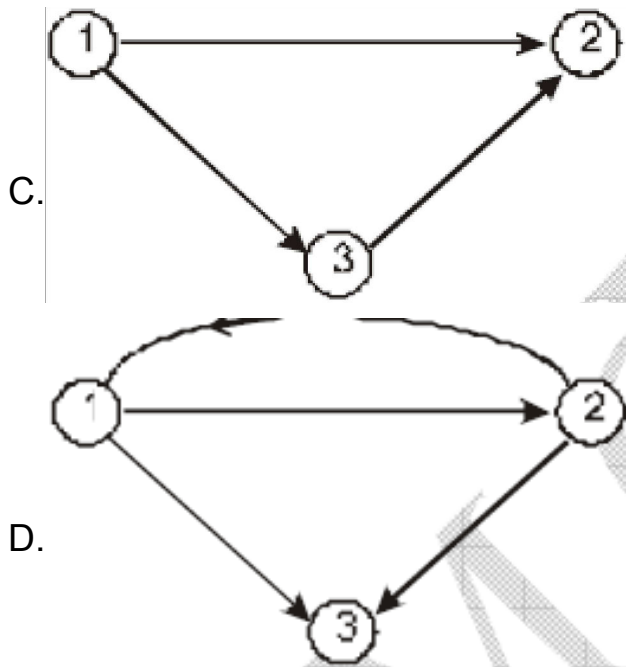
37. How many characters per second (7 bits + 1 parity) can be transmitted over a 2400 bps line if the transfer is synchronous (1 start and 1 stop bit)?

(1) 300   (2) 240   (3) 250   (4) 275

38. Which of the following statements are true?

(i) Constructors may be declared in private, public or protected section.

(ii) An object with a constructor or destructor can not be used as a member of a union.

(iii) There can be virtual constructors.

Choose the correct option:

(1) Only (i) is true   (2) Both (i) and (ii) are true

(3) Only (iii) is true   (4) Only (ii) is true

39. What happens when an exception is not caught?

(1) Code in the catch block is generated.

(2) An error occurs.

(3) The program is aborted.

(4) The program executes normally.

40. _____ is the abstraction process of introducing new characters to an existing class of objects to create one or more new classes of objects.

(1) Specialization   (2) Generalization

(3) Abstraction   (4) Aggregation

41. What will be the result of the following addition?

$(3BCA.5078)_{16} + (9EBD.97F3)_{16} + (5FB.E2C)_{16}$

(1) $(E082.CB2C)_{16}$　　　　　(2) $(14916.9241)_{16}$

(3) $(E083.CB2B)_{16}$　　　　　(4) $(E916.9241)_{16}$

42. Assertion (1): A digital multiplexer can also be used to implement combinational logic function

Reason (R): In a combinational circuit, the current output depends on the previous outputs also

(1) Both A and R are individually true and R is the correct explanation of A

(2) Both A and R are individually true, but R is not the correct explanation of A

(3) A is true, but R is false

(4) A is false, but R is true

43. The content of a 4-bit register is initially 1101. The register is shifted 2 times to the right with the serial input being 1011101.What is the content of the register after each shift?

(1)1110, 0111　　　　　　　(2) 0001, 1000

(3)1101, 1011　　　　　　　(4) 1001, 1001

44. Assume that there are 32 input-output storing units, 32 functions to select and 16 data routes to select. Assume control memory of 16384. How many encoded bits are required assuming that there is a next address field at the microinstructions? Two MUX are used one at input and one at output for a set of 8 registers.

(1) 26　　　　(2) 27　　　　(3) 28　　　　(4) 29

45. Match the following categories with respect to 8085 instructions:

Column I	Column II
p) Data transfer instruction	(i) CALL
q) Arithmetic Instruction	(ii) CMP
r) Logical Instruction	(iii) STA
s) Branch Instruction	(iv) DCR

　　　　(p) (q)　(r)　(s)

(1) (ii), (iii), (iv), (i)

(2) (iii), (ii), (i), (iv)

(3) (i), (iii), (ii), (iv)

(4) (iii), (iv), (ii), (i)

46.   Find odd one out:

(1) ANAR
(2) PCHL

(3) ORAR
(4) CMA

47.   The PCI bus is the important bus found in all the new Pentium systems because

I.It has plug and play characteristics

II.It has ability to function with a 64 bit data bus

III.Any Microprocessor can be interfaced to it with PCI controller or bridge

(1) Only I and II
(2) Only II and III

(3) Only I and III
(4) All of the above

48.   A single register to clear the lower four bits of the accumulator in 8085 assembly language is?

(1) XRI 0FH   (2) ANI F0H   (3) XRI F0H   (4) ANI 0FH

49.   The part of a database management system which ensures that the data remains in a consistent state is,

(1) Authorization and integrity manager

(2) Buffer manager

(3) Transaction manager

(4) File manager

50.   Which of the following are factors in deciding on database distribution strategies?

I.Organizational forces

II.Frequency of data access

III.Reliability needs

(1) Only I and II
(2) Only II and III

(3) Only I and III
(4) All of the above

51.   One way to generate, store and forward messages for completed transactions to be broadcast across a network is through the use of

(1)Stored procedures
(2) Triggers

(3) Functions
(4) SQL statements

52. Evaluate these two SQL statements and determine what is true about them?

I.SELECT last_name, salary , hire_date

  FROM EMPLOYEES

ORDER BY salary DESC;

II.SELECT last_name, salary, hire_date

  FROM EMPLOYEES

ORDER BY 2 DESC;

(1) The two statements produce identical results.

(2) The second statement returns a syntax error.

(3) There is no need to specify DESC because the results are sorted in descending order by default.

(4) The two statements can be made to produce identical results by adding a column alias for the salary column in the second SQL statement.

53. Which syntax turns an existing constraint on?

(1)ALTER TABLE table_name

  ENABLE constraint_name;

(2)ALTER TABLE table_name

  STATUS = ENABLE CONSTRAINT constraint_name;

(3)ALTER TABLE table_name

  ENABLE CONSTRAINT constraint_name;

(4)ALTER TABLE table_name

  STATUS ENABLE CONSTRAINT constraint_name;

54. What is the type of Oracle backup in which all uncommitted changes have been removed from the data files?

(1) Full backup   (2) Consistent backup

(3) Inconsistent backup   (4) Differential backup

55. Consider the diagram
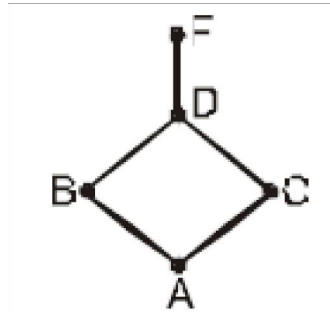
A Euler circuit is,

(1) FDCABF   (2) FDBACDF

(3) FDCACF   (4) None of these

56. When a C/SDK program in message handling begins, it immediately registers at least one window class using.

(1) Register class ( ) API function and a RGSCLASS data structure

(2) Register class ( ) API function and a WNDCLASS data structure

(3) Window Register class ( ) API function and a RGSCLASS data structure

(4) Window Register class ( ) API function and a WNDCLASS data structure

57. For window message components, which one is not correct.?

(1) Window message has an unsigned integer containing the actual message.

(2) LPARAM is a 4-byte parameter

(3) WPARAM is a 32-Bits parameter in win 32.

(4) WPARAM contains additional data, required to handle the message

58. What is/are false about UNIX operating system?

(i) Unix consider all files to be a continuous sequence of characters.

(ii) Unix treat physical devices as if they are files & hence programs can access devices with same syntax as files.

(iii) Unix is multi user, multi-programmed but not time scheduled operating system.

(iv) Programs written using UNIX can not be run on a variety of architecture.

(1) (i), (ii), (iv)   (2) (ii), (iii), (iv)

(3) (iii), (iv) (4) (ii), (iv)

59. Given

LPP max z = $6x_1 + 4x_2$

Subject to $x_1 + 2x_2 \leq 720$

$2x_1 + x_2 \leq 780$

$x_1 \leq 320$

$x_1, x_2, x_3 > 0$

The optional value of objective function will be

(1) 2550 (2) 2560 (3) 2540 (4) None of these

60. The set $\{(x, y) : y < x^2 + 2x + 1\}$ is

(1) Convex set (2) Non convex set

(3) Convex polyhedron (4) None of these

61. A DMS X has four symbols x_1, x_2, x_3, and x_4 with $P(x_1) = \frac{1}{2}$, $P(x_2) = \frac{1}{4}$

and $P(x_3) = 1/8$

$P(x_4) = \frac{1}{8}$

What is the entropy for Shannon – fano coding?

(1) 2.75 (2) 1.75 (3) 0.75 (4) 1.05

62. A push down automation has

(1) Infinite set of pushdown symbols

(2) Only one special pushdown symbol

(3) Finite set of input symbols

(4) all of these

63. In TM, the tape has k-tuple of tape symbol, where k is,

(1) Number of tracks

(2) Number of alphabets

(3) Set of tape symbols

(4) None of these

64. The given language

L = { $a^m\ b^m$: m positive} is,

(1) Regular (2) Not regularz

(3) unpredictable   (4) None of these

65. The Breadth - first search Tree are used in,

   (1) Banking   (2) Defense

   (3) Law   (4) All of these

66. Which of the following parser is more powerful and expensive?

   (1) Simple LR   (2) Look ahead LR

   (3) Canonical LR   (4) None of these

67. Which of the following is not the required condition for binary search algorithm?

   (1) The list must be sorted

   (2) there should be the direct access to the middle element in any sublist

   (3) There must be mechanism to delete and/or insert elements in list

   (4) none of above

68. A BCNF is

   (1) Loss less join and dependency preserving

   (2) Loss less join and not dependency preserving

   (3) Not loss less join and dependency preserving

   (4) None of these

69 Functional dependencies are generalization of

   (1) Key dependencies

   (2) Relational dependencies

   (3) Database dependencies

   (4) Functional dependencies

70. The network of the given figure is:

   (1) a single layer feed-forward neural network

   (2) an autoassociative neural network

   (3) a multiple layer neural network

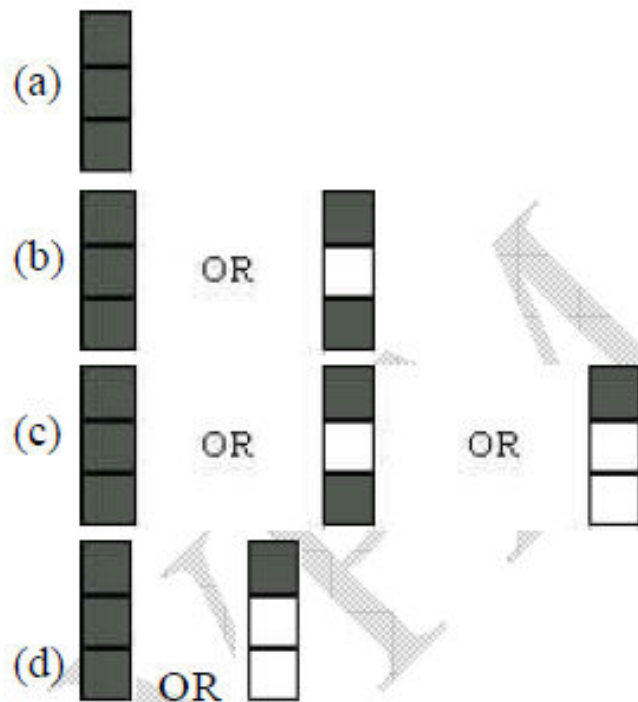   (4) a multiple layer feed-forward neural network
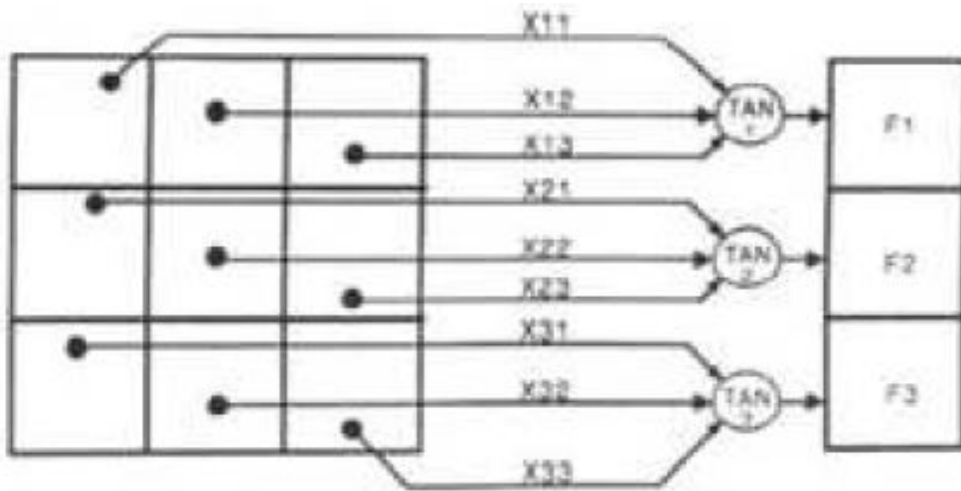
71. The network shown in the following Figure is trained to recognize the characters H and T as shown below:

INPUT   OUTPUT   INPUT   OUTPUT

If the following pattern was given


INPUT   OUTPUT
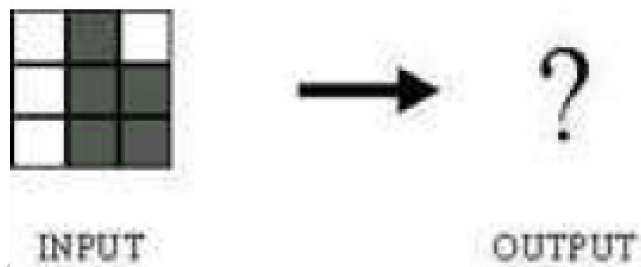
What would be the output of the network?

72. _____protocol is typically used for error reposing.

 (1) DNS   (2) ICMP   (3) POP-3   (4) IMCP

73. When processing on output in XML, "new line" symbols are

 (1) Copied into output "as is", i.e. "CR + LF" for window, CR for macintosh, LF for Unix.

 (2) Converted to single CR symbol

 (3) Converted to single LF symbol

 (4) Discarded

74. How can you open a link in a new browser window?

 (1) < a hrsf = "url" new>

 (2) < a href = "url" target = "-blank" >

 (3) <a href = "url" target = "new">

 (4) None of these

75. Using which tag we insert a Java script in HTML page?

 (1) < save script type = "text/javescript" > </javascript>

 (2) < script type = "text/javascript"></jscript>

 (3) <Jscript type = "text/javascript"> </jscript>

 (4) <HTML script type = "text/javascript"> </HTML script>

76. Which of the following aggregate methods does not work if hiring and lay off are possible?

(1) The linear rule

(2) Simulation

(3) The management coefficients model

(4) The transportation method.

77. (i) DPSH with eight phases will enable the bit rate to be tripled over the corresponding two phase modulation.

(ii) The diameter of a single mode fiber is generally greater than the diameter of a multi mode fiber.

Which of the following option is correct w.r.t the above statement?

(1) (i) – T (ii) – F

(2) (i) – F (ii) –F

(3) (i)–F (ii) – T

(4) (i) – T (ii) – T

78. If the ……………. Bit in X.25 standard is set to 1, it means that there is more than one packet.

(1) Q   (2) D   (3) M   (4) P

79. Match the following

(1) Time domain reflectometry   (i) transmission

(2) Frequency hopping and spread

spectrum techniques are involved in   (ii) A technique that detects cable breaks bad taps or loose connectors

(3) 10 base 2   (iii) Multiplexing

(4) Sharing of communication channel.   (iv) thin ethernet

Which of the following option is correct for the given match-ups?

(1) (1) – (ii) (2) – (i) (3) – (iv) (4) – (iii)

(2) (1) – (i) (2) – (ii) (3) – (iv) (4) – (iii)

(3) (1) – (iii) (2) – (ii) (3) – (i) (4) – (iv)

(4) (1) – (iv) (2) – (i) (3) – (iii) (4) – (ii)

80. What is the maximum burst length on a 155.52 Mbps ATM ABR connection whose PCR value 200,000 and whose L value is 25 msec?

(1) 13   (2) 12   (3) 14   (4) 15

81. Solve the minimum-span problem for the network given in Fig. The numbers on the branches represent the costs of including the branches in the final network.
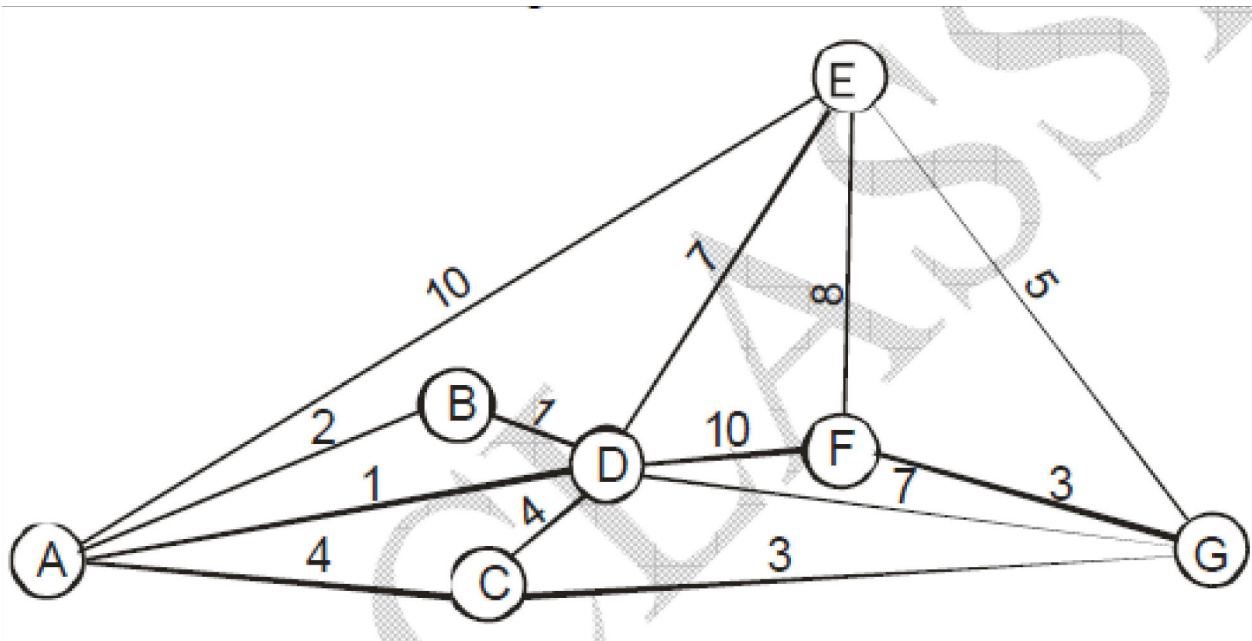
Find the minimum cost for connecting the network.

(1) 16   (2) 15   (3) 17   (4) 18

82. Consider the following CFG

S →OB   S → bA

B → b   A → a

B → bS   A → aS

B → aBB   A → bAA

Consider the following derivation

S ⇒ aB

   ⇒ aaBB

   ⇒ aaBb

   ⇒ aabSb

   ⇒ aabbAb

     ⇒ aabbab

This derivation is

(1) A leftmost derivation

(2) A rightmost derivation

(3) Both leftmost and rightmost derivation

(4) Neither leftmost nor rightmost derivation

83.   Which of the following regular expression identity is true

(1) r(*) = r*

(2) (r* s*)* = (r + s)*

(3) (r + s)* = r* + s*

(4) r*s* = r* + s*

84.   Consider following grammar

S $\rightarrow$ gA

A $\rightarrow$ aA/eB/g

B $\rightarrow$ gA

Equivalent left linear grammar will be

(1).S $\rightarrow$ Ag

   A $\rightarrow$ Aa /Bg/ g

   B $\rightarrow$ Ag

(2).S $\rightarrow$ gA

   A $\rightarrow$ aA / gB / g

    B $\rightarrow$ gA

(3).S $\rightarrow$ AB

   A $\rightarrow$ aA / gB / g

   B $\rightarrow$ gA

(4) None of above

85.   A self relocating program is one which

(1) Cannot be made to execute in any area of storage other than the one designated for it at the time of its coding or translation.

(2) Consists of a program and relevant information for its relocation.

(3) Can itself perform the relocation of its address-sensitive portions

(4) All of the above

86.   Arrange the following steps of structured design methodology in the correct order

(i) First level factoring

(ii) Restate the problem as a data flow diagram

(iii) Identify the input and output data elements

(iv) Factoring of input, output and transform branches.

(1) (ii)-(iii)-(iv)-(i)   (2) (ii)-(iii)-(i)-(iv)

(3) (ii)-(iv)-(iii)-(i)   (4)(i)-(ii)-(iii)-(iv)

87. Which of the following options is true for the given statement?

(i) On line data capture is preferable to batch data entry because it reduces human effort in entering data.

(ii) Prototyping motivates the end user and required his active participation.

(1) (i) — T (ii) — F   (2) (i)— F (ii) — T

(3) (i) — F (ii) — F   (4) (i) — T (ii) — T

88. Software metrics cannot be applied in

(1) Cost and size estimation techniques.

(2) Controlling software development projects

(3) Prediction of quality levels

(4) None of these

89. Representation of list in PROLOG is

(1) {2, 4, 8, 10, 12}

(2) [2, 4, 8, 10, 12], ["jack", "jill", "jane 1"]

(3) [2, 4, 8, 10, 12]

(4) {"jack", "jill", "jane 1"}

90. Which of the following is a control structure in PROLOG?

(1)   p:-a, b, c;

        p:-d, e, f;

(2)   p:-a; b; c;

        p:-d; e; f;

(3)   p:-a, b, c;

        p:-d, e, f;

(4) None of these

91. _____ is the number of arguments in a predicate form.

(1) Atom   (2) Arity

(3) Parameter   (4) Clause

92. Which of the following is not a graphic standard?

(1) MHEG   (2) PREMO

(3) OAD　　　　　　　　　　　　(4) Acrobat

93.　Arrange the following steps of animation in the correct sequence.

(i) Object definitions

(ii) Generation of in-between frames

(iii) Storyboard layout

(iv) Keyframe specifications

(1) (iii), (i), (iv), (ii)　　　　　　(2) (iii), (iv), (ii), (i)

(3) (i), (ii), (iii), (iv)　　　　　　(4) (iv), (ii), (i), (iii)

94.　_____ allow object motion characteristics to be specified as part of the object definitions

(1) Key frame systems　　　　　(2) Parameterized systems

(3) Scripting systems　　　　　　(4) None of these

95.　Which of the following statement is true?

(1) Macro definition can not appear within other macro definition in assembly language programs

(2) Overlaying is used to run a program which is longer than the address space of computer.

(3) Mutual memory can be used to accommodate a program which is longer than the address space of computer.

(4) It is not possible to write interrupt service routines in a high level language.

96.　In anomaly detection, to detect anomalous login time for a user we use,

(1) Monitoring system calls commands

(2) Linux based commands

(3) Monitoring shell commands

(4) Monitoring kernel commands

97.　main( )

```
{
int x = 4, y = 0, z;
while(x > = 0)
{
if (x = = y)
```

```
break;
else
printf("\n %d%d", x, y);
x- -;
y++;
}
}
```

What will be the output of the given program

(1)   3   1

       4   0

(2)   4   0

       3   1

(3)   1   3

       0   4

(4)   3   3

       4   0

98. _____ and _____ are the two advantages of high level programming language

(1) Readability, Robustness

(2) Portability, Robustness

(3) Readability, Portability

(4) None of these

99. Which of the following options is correct for the given statements?

(i) A PROLOG program does not involve a number of facts and rules

(ii) PROLOG is known for its in-built depth first search engine and for its case in qui ck prototyping.

(iii) A matching in PROLOG is performed argument to argument only.

(1) Only (i) is correct   (2) Only (ii) is correct

(3) (i) and (ii) both are correct   (4) All are correct

100.
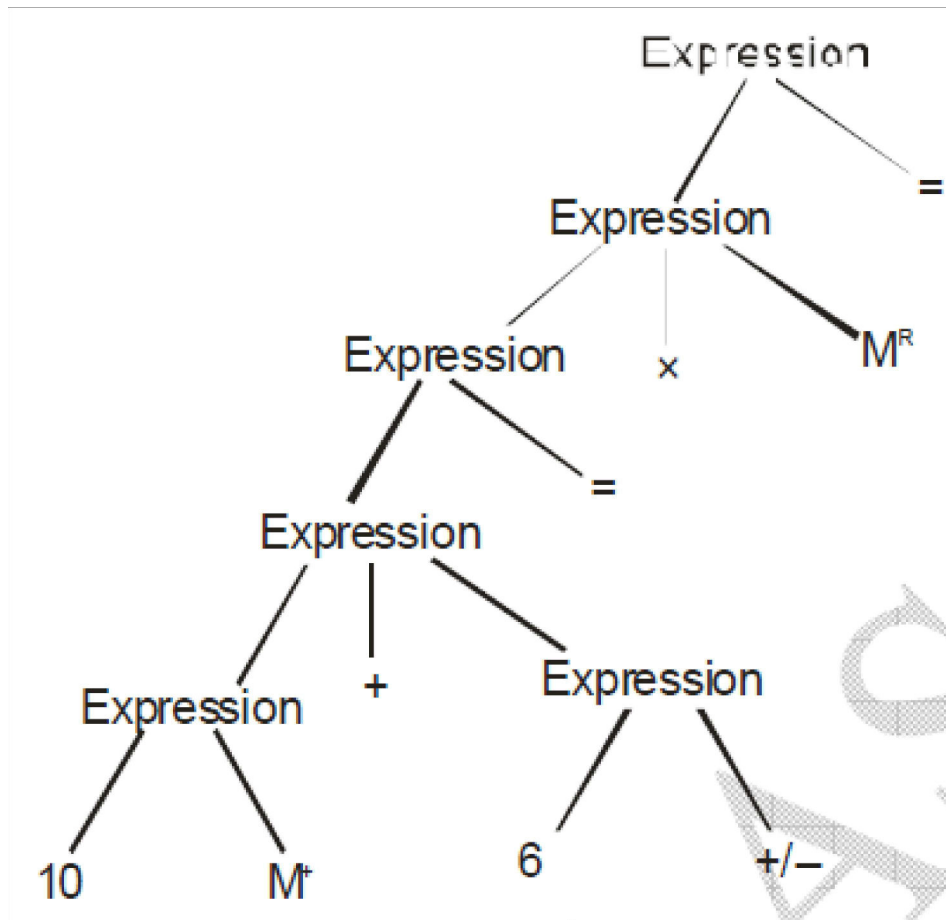
Above abstract syntax tree is for expression

(1) 10 M* * / . + 6 = X = MR

(2) 10 M* + 6*/. = X MR =

(3) 10M* + 6 * /. X MR = =

(4) 10M* * /. + 6 X MR = =

ANSWER KEY
PAPER-I

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer	4	1	4	2	4	3	1	2	1	2	1	4	3	4	1	1	4	2	3	3
Question	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Answer	4	1	2	4	1	4	1	3	4	2	4	3	1	1	1	2	3	4	3	4
Question	41	42	43	44	45	46	47	48	49	50										
Answer	2	2	1	4	1	4	4	4	3	4										

PAPER-II

QUESTIONS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ANSWER	3	2	4	1	2	3	4	2	4	3	3	3	2	2	4	1	1	2	2	3
QUESTIONS	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
ANSWER	4	3	3	3	3	3	1	2	3	4	1	1	1	4	2	1	1	4	3	1
QUESTIONS	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
ANSWER	3	3	1	4	4	2	4	2	3	4	2	1	3	2	1	2	4	3	2	2
QUESTIONS	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
ANSWER	2	3	1	2	4	3	3	2	1	1	2	2	3	2	2	4	1	3	1	2
QUESTIONS	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
ANSWER	3	4	2	1	3	2	3	4	2	1	2	3	1	2	2	3	2	3	2	2

HINTS AND SOLUTIONS
PAPER-I

1.(4) Eklavya schools will be established for scheduled caste (SC) and schedule tribe students by 2022 on the lines of Navodaya schools.

They will be model residential schools set up in each Block. It will in areas with more than 50% tribal areas and 20,000 tribal people.

These schools will be part of Navodaya Vidyalayas. It will provide training in sports and skill development.

It has special facilities for preserving local art and culture.

2.(1) Revitalising Infrastructure and Systems in Education (RISE) Scheme :

RISE scheme aims to lend low-cost funds to government higher educational institutions. It will be launched with a total investment of Rs. 1 lakh crore in the next four years. It will be financed via restructured higher education financing

agency (HEFA), a non-banking financial company.

3.(4) The World Sustainable Development Summit – 2018 was held in New Delhi on February 16.

The summit will address a wide variety of issues, including combating land degradation and air pollution, effective waste management and create financial mechanisms to enable effective climate change mitigation.

The theme of the 2018 Summit is – Partnerships for a Resilient Planet, which seeks to create action frameworks to resolve some of the most urgent challenges facing developing economies in the backdrop of climate change.

It seeks to bring together on a common platform, global leaders and thinkers in the fields of sustainable development, energy and environment sectors.

4.(2) The 9-member committee, headed by former ISRO chief K Kasturirangan, was constituted by the Union HRD Ministry to draft new National Education Policy (NEP) on June 2017.

The committee will submit its report by March 31, 2018. The existing NEP was framed in 1986 and revised in 1992.

5.(4) An historic agreement to combat climate change and unleash actions and investment towards a low carbon, resilient and sustainable future was agreed by 195 nations in Paris in Dec 2015.

The Paris Agreement for the first time brings all nations into a common cause based on their historic, current and future responsibilities.

The universal agreement's main aim is to keep a global temperature rise this century well below 2 degrees Celsius and to drive efforts to limit the temperature increase even further to 1.5 degrees Celsius above pre-industrial levels.

The 1.5 degree Celsius limit is a significantly safer defense line against the worst impacts of a changing climate.

6.(3) Under Part XXI of the Constitution of India, which deals with "Temporary, Transitional and Special provisions", the State of Jammu and Kashmir has been accorded special status under Article 370.

Even though included in 1st Schedule as 15th state, all the provisions of the Constitution which are applicable to other states are not applicable to J&K.

Special Features- J&K is the only state in India which has a Constitution of its

own. The Constitution of J&K was enacted by a separate Constituent Assembly set up by the State and it came into force on 26th January 1957.

7.(1) Global warming is the increase in Earth's near-surface air and ocean temperatures. The greenhouse effect is when water and carbon dioxide absorb outgoing infrared radiation, increasing the planet's temperature.

Greenhouse gases contribute to global warming.

What is determined to be a greenhouse gas is any heat-trapping gas present in the Earth's atmosphere.

The two most common greenhouse gases are water vapor and carbon. These gases help absorb infrared radiation and regulate the Earth's climate.

However, the increase in industrial production has increased the amount of greenhouse gases present in the atmosphere.

The increase in carbon dioxide emissions has made it difficult for heat to escape the atmosphere which in turn contributes to the warming effect.

8.(2) The Vienna Convention for the Protection of the Ozone Layer is a Multilateral Environmental Agreement. It was agreed upon at the Vienna Conference of 1985 and entered into force in 1988.

It acts as a framework for the international efforts to protect the ozone layer.

The Montreal Protocol on Substances that Deplete the Ozone Layer (a protocol to the Vienna Convention for the Protection of the Ozone Layer) is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion.

The Minamata Convention on Mercury is an international treaty designed to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds.

The Convention was signed by delegates representing close to 140 countries on 19 January 2013 in Geneva and adopted later that year on 10 October 2013 on a Diplomatic Conference held in Kumamoto, Japan. The Convention is named after the Japanese city Minamata.

9.(1) In July 2013, Supreme Court had ruled that a person, who is in jail or in police custody, cannot contest elections to legislative bodies.

Representation of the People (Amendment and Validation) Bill, 2013

however,brought two key changes:

Firstly , even if a person is prohibited from voting due to being in police custody or in jail, as long as his name is entered on the electoral roll he shall not cease to be an elector.

This implies that he can file nomination for an election. Secondly, definition of "disqualified" in the Act has been amended.

Prior to this act, the definition of disqualified means disqualified for either being chosen as or being a MP or MLA.

Secondly, definition of "disqualified" in the Act has been amended.

The amendment adds a ground to the definition that the disqualification has to be due to conviction for certain specified offences and can be on no other ground.

Conviction for only these certain offences would result in the person's name being removed from the electoral roll and he would cease to be an elector.

10.(2)

11.(1) Water Borne diseases are largely caused by micro-organisms present in human or animal waste, which find their way into human body.

These diseases are infectious, which means that they can spread from one person to another.

So high standards of hygiene and sanitation are needed to stop the disease from spreading.

Waterborne diseases include:

(i) Typhoid fever

(ii) Giardia

(iii) Dysentery

(iv) Cholera

(v) Diarrhoea (caused by a variety of pathogens)

(vi) Hepatitis

(vii) Polio

(viii) Worms

12.(4) Research has been defined in a number of different ways.

A broad definition of research is given by Godwin Colibao: "In the broadest sense of the word, the definition of research includes any gathering of data, information,

and facts for the advancement of knowledge."

Another definition of research is given by John W. Creswell, who states that "research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue".

It consists of three steps: pose a question, collect data to answer the question, and present an answer to the question.

The Merriam-Webster Online Dictionary defines research in more detail as "a studious inquiry or examination; especially investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws.

13.(3) In **descriptive survey method**- we've to use questionnaires (Because it's 'survey).

Descriptive research is all about describing people who take part in the study.

There are three ways a researcher can go about doing a descriptive research project, and they are: Observational, Case study and Survey, defined as a brief interview or discussion with an individual about a specific topic

Historical method- we have to use primary and secondary sources.

Historical method comprises the techniques and guidelines by which historians use primary sources and other evidence, including the evidence of archaeology, to research and then to write histories in the form of accounts of the past.

In **experimental method**- we can collect data in a way that permit standardized tests.

The experimental method is a systematic and scientific approach to research in which the researcher manipulates one or more variables, and controls and measures any change in other variables.

An ex post facto research design is a method in which groups with qualities that already exist are compared on some dependent variable.

Also known as "after the fact" research, an ex post facto design is considered quasi-experimental because the subjects are not randomly assigned - **they are grouped based on a particular characteristic or trait.**

14.(4) According to Burton, **Teaching is the stimulation, guidance, direction and encouragement of learning**.

Good teaching requires some basics that a teacher should follow to achieve the main goal of teaching.

Good teaching is as much about passion as it is about reason. It's about not only motivating students to learn, but teaching them how to learn, and doing so in a manner that is relevant, meaningful, and memorable.

It's about caring for your craft, having a passion for it, and conveying that passion to everyone, most importantly to your students.

Good teaching is also about bridging the gap between theory and practice. It is about listening, questioning, being responsive, and remembering that each student and class is different. It is about caring, nurturing, and developing minds and talents.

Diagnosis, Remedy, Direction and Feedback are required for good teaching.

15.(1) The National Institution for Transforming India, also called NITI Aayog, was formed via a resolution of the Union Cabinet on January 1, 2015.

NITI Aayog is the premier policy 'Think Tank' of the Government of India, providing both directional and policy inputs.

While designing strategic and long term policies and programmes for the Government of India, NITI Aayog also provides relevant technical advice to the Centre and States.

The Government of India, in keeping with its reform agenda, constituted the NITI Aayog to replace the Planning Commission instituted in 1950.

An important evolutionary change from the past, NITI Aayog acts as the quintessential platform of the Government of India to bring States to act together in national interest, and thereby fosters Cooperative Federalism.

The Prime minister is its Chairperson.

16.(1) Horizontal communication is the communication where information or messages flows among the similar or same level statuses of people in the organizational structure.Horizontal communication is the communication that flows laterally within the organization, involves persons at the same level of the organization. Horizontal communication normally involves coordinating information and allows people with the same or similar rank in an organization to cooperate or collaborate. Thus in terms of statuses horizontal method is used.

17.(4) Spam is an irrelevant or unsolicited messages sent over the Internet, typically to large numbers of users, for the purposes of advertising, phishing, spreading malware, etc.

Spam is flooding the Internet with many copies of the same message, in an attempt to force the message on people who would not otherwise choose to receive it. Most spam is commercial advertising, often for dubious products, get-rich-quick schemes, or quasi-legal services.

18.(2) Propositions are contradictory when the truth of one implies the falsity of the other, and conversely.

if 'All thieves are poor' is false, then the proposition 'Some thieves are not poor' must be true**.**

19.(3) non verbal communication is communication of feelings, emotions, attitudes, and thoughts through body movements / gestures / eye contact, etc.

20.(3) % increase = $\dfrac{0.25 crore}{1\ crore} \times 100$

= 25%

21.(4) for company A

1 + 1.25 + 1.5 +1.75 + 1.75 + 1.75 +2

= 11 crore

22.(1) (2.5 – 1) crores = 1.5 × 100 00 000

= 150 00 000

23.(2) Total production of B

= 2.5 + 2.5 + 3 + 2.75 +2.25 + 2.25 +2.5

= 17.75

Average production = $\dfrac{17.75}{7} = 2.55$

24.(4) In year 2004.

25.(1) Qualitative data collection techniques were used as the primary research methods for this study. Participant and direct observation plus note taking were the most important techniques used.

26.(4) Production was at very low level.

27.(1) Ethnic diversity of the people was not appropriately realized by the Central Government.

28.(3) Central economic planning found to be difficult because autonomy w as given to the States in certain matters

29.(4) Because that time no common language emerged.

30.(2) "The Indianisation of the Indian Civil Service", can be cited as an exercise in democratic practice in India before Independence

31.(4) The information to be collected in survey method are related to present position, aims of the research &the attainment of aim of research

Exposure units must be defined Must be considered in developing DQOs for project, or results may not be accepted.

Sufficient samples are required 8-10 samples w hen contaminant concentrations vary w ithin a narrow range 10-15 sample w hen concentrations are less predictable

Calculate 90th Upper Confidence Limit (UCL)

32.(3) One of the essential characteristics of research is usability.

33.(1) A parliamentary system is a system of democratic government in which the ministers of the Executive Branch derive their legitimacy from and are accountable to a Legislature or parliament; the Executive and Legislative branches are interconnected. It is a political system in which the supreme power lies in a body of citizens w ho can elect people to represent them.

34.(1) IVRI is situated in Izat Nagar.

IAT is situated in Pune

IISc is situated in Banglore

NIEPA is situated in Delhi.

35.(1) The prime minister of India is appointed from the leading Party in Lok Sabha.

36.(2) The study of interrelations between Organism and their environment is called ecology.

37.(3) The term ICT is now also used to refer to the convergence of audio-visual and telephone networks with computer networks through a single cabling or link system.

38.(4) Fossil fuels are fuels made by natural processes such as anaerobic decomposition of buried dead organisms.

Ex. Oil, Natural gas, coal etc.

39.(3) Noise in excess of 80-100DB is called noise pollution.

40.(4) Effectiveness of teaching depends on Subject Understanding of the Teacher

41. (2) The participation of students w ill be maximum if Discussion Method is used for teaching.

42.(2)
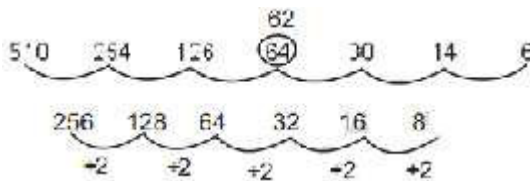
“30, 64 is wrong & must be replaced by 62.

43.(1) Deductive reasoning determines whether the truth of a conclusion can be determined for that rule, based solely on the truth of the premises.

44.(4) $(2)^2 = 4$, $(5)^2 = 25 \Rightarrow 425$

$(2)^2 = 4$, $(4)^2 = 16 \Rightarrow 416$

$(3)^2 = 9$, $(5)^2 = 25 \Rightarrow 925$.

45.(1) Such decisions as given in the statement are taken only after taking the existing vacancies into consideration. So, I implicit while II does not implicit.

46.(4) CD-ROM disk is the latest write-once optical storage media

47.(4) Domain Name identifies a specific web page and its computer on the Web.

48.(4) The required region is the one which is common only to the rectangle and circle and is not a part of either the triangle or square

49.(3) The required region is the one which lies inside the circle but outside the rectangle, square and triangle,

50.(4) The man in the photo is the son of the sister of Bajpai. Hence, Bajpai is the maternal uncle of the man in the photograph.

1.(3) Transfer the seven maxterms to the map below as 0s.

$$\text{Out} = (A+B+C+\overline{D})(A+B+\overline{C}+D)(A+\overline{B}+C+\overline{D})(A+\overline{B}+C+D)$$
$$(\overline{A}+\overline{B}+\overline{C}+D)(\overline{A}+B+C+\overline{D})(\overline{A}+B+\overline{C}+D)$$

Map the 0s as they appear left to right top to bottom on the map above. Now form groups of cells.

	input	complement	Sum-term
ABCD = X001	> X110	>	$(B+C+\overline{D})$
ABCD = 0X01	> 1X10	>	$(A+C+\overline{D})$
ABCD = XX10	> XX01	>	$(\overline{C}+D)$

$$\text{Out} = (B+C+\overline{D})(A+C+\overline{D})(\overline{C}+D)$$

The final result is product of the three sums i.e.
Out = (B+C+ NOT(4)) (A+C+ NOT(4)) (NOT(3)+D)

2.(2)

F(W,X,Y,Z) = Óm (0,2,5,6,8,10,13,14,15)

3.(4) SONET rings can be classified by the routing principle and the SONET over-head used for triggering protection switching. A ring is called a unidirectional ring if bidirectional working signals follow opposite physical routes around a ring , while bidirectional working signals in a bidirectional ring follow the same route. Due to this routing principle, a unidirectional and a bidirectional ring, require one and two fibers respectively, to support their working traffic.

4.(1) Each ISDN line is made up of separate 64-Kbps "channels" for sending and receiving calls, plus a channel that is used primarily for signaling.

5.(2) Routing Information Protocol is a distance vector routing protocol that uses hop count as its metric. The maximum hop count is 15. 16 hops are considered unreachable.RIP updates are broadcast every 30 seconds by default. RIP has an administrative distance of 120.

6.(3) The sum of 87H and 79H =100H. Therefore, the accumulator will have 00H, and the flags will be S =0, Z = 1, CY = 1

7.(4) If the stack pointer is initialized with (4FEB) H, then after execution of push op-eration in 8085 microprocessor, stack pointer shall be 4FED.

8.(2) The 8085 differentiates between the input and output ports of the same address by the control signal. The input port requires the RD and the output port requires the WR signal.

9.(4) Relations for the ordered pairs (^,^),(-,-) , (+,+), (*,*) in the operator precedence table constructed for the grammar will be <,>,>,> as exponent is of right associative to itself and + , − , * and / are left associative

10.(3) Proof as follows:

1. Let P=Q=R=EMPTY SET. The equation is satisfied. So this rules out (2).

2. Let P=R be $\sum^*$ then any Q will satisfy the equation. The demands of (1) & (4) are invalid.

3. So the answer is (3).

11. (3) It is not possible to convert nondeterministic PDA to deterministic PDA

12. (3) CPU burst time indicates the time for which the process needs the CPU.

Considering FCFS scheduling

Processes CPU	Burst time
P1	10
P2	5
P3	5

For processes arriving in the order: P1 , P2 , P3

The Gantt Chart for the schedule is:

P1	P2	P3
0	10	15

Waiting time for P1 = 0; P2 = 10; P3 = 15

Average waiting time: (0 + 10 + 15)/3 = 8.33 unit of time

13.(2) (p) time sharing-Technique that allows multiprocessing on a computer with a single CPU

(q) process-Activity of executing a program

(r) bootstrap-Program first executed when a computer is turned on

(s) shell-Part of an operating system that communicates with the user

14. (2) Aging resolves or avoids the problem of starvation.

15. (4) Option (1), (2) and (3) all are correct.

Page-Stealer process is the Kernel process that makes room for the incoming pages, by swapping the memory pages that are not the part of the working set of a process.

It is created by the Kernel at the system initialization and invokes it throughout the lifetime of the system.

Kernel locks a region when a process faults on a page in the region, so that page stealer cannot steal the page, which is being faulted in.

16.(1) The shell calls fork(); the child process calls exec() and the parent calls wait(). The shell is just another process that can take a string as standard input, look for the program referenced by the string, and then run this program. Unless the program is put in the background, the shell will wait until the program has finished.

17.(1) Evaluation of the target market is an activity of a contract review

18.(2) Insufficient identification is a process-related problem. Unidentified, partially identified, and unplanned risks pose a threat to the success of a software project. You need to intensively identify risks and evolve a risk management plan such that the project is completed successfully, on time

19.(2) Five nines of reliability refer to a product that is operational 99.999% of the time.

20. (3) Static analyzers ;A static analyzer operates from a pre-computed database of descriptive information derived from the source text of the program.

Code inspectors: A code inspector does a simple job of enforcing standards in a uniform way for many programs. These can be single statement or multiple statement rules.

Output comparators :These are used in dynamic testing-both single-module and multiple-module varieties to check that predicted and actual outputs are equivalent.

Standard enforces :This tool is like a code inspector. The main distribution is that a full-blown static analyzer looks at whole programs, whereas a standard enforcer looks at only single statements.

21.(4) Disparate data- Production data

Non volatile data- Query and analysis

Data granularity- Level of detail

22.(3) Credit theft is impossible with smart card as key to unlock encrypted information is required and also due to the absence of external account number on the card.

23.(3) FAT12 is a12-bit version developed by Microsoft in1977 for Microsoft Disk

BA SIC

FAT16 is a 16-bit version introduced in July 1988 for MS-DOS 4.0

FAT32 is a 32-bit version introduced in August 1996 for Windows 95 OSR2

24.(3) TRACE macro sends an output message to the debug window of compiler. User can also see the trace messages without the debugger running using DebugView.

25.(3) PVIEW is used to kill errant hidden processes in windows95. With PView, user can modify status of processes running on the system. As a result the entire system's processes can be stopped and potentially halt.

26.(3) Select three columns from the COURSES table, of which the third one has a constant value, i.e. " = PRICE". Sort the data according to the second column, in ascending order

27.(1) It must be translated to the actual relation in the conceptual model of the database

28.(2) Because it may have the values from all the domains.

29.(3) In order traversal is left->root->right and pre order is root->left-> right so it can used to find the post order traversal. first check the node in preorder and then find the root in in

order, check left and right nodes and create a tree and then find the post order

30.(4) The queue can not be reversed as it is based on the concept of FIFO.

31.(1) The time complexity of Prim's Algorithm is O(n*n).

32.(1) If a B-tree is created with order m then the node may have max. of m children and then it splits into two and middle child becomes the root

33.(1) A can draw a ticket in $^3C_1$ = 3 ways.

Number of cases in which A can get a prize is 1. Probability of A's success = 1/3

B can draw a ticket in $^9C_3$ ways = 9.8.7/3.2.1= 84 ways.

Number of ways in which B gets all blanks = $^6C_3$ = 6.5.4/32.1=20

Number of ways of getting a prize = 84 – 20 = 64

Thus the probability of B's success $= 9 \dfrac{64}{84} = \dfrac{16}{21}$

So A's probability of success: B's probability of success $= \dfrac{1}{3} \cdot \dfrac{16}{21}$

34.(4) Here P represents file pointer. It points to the structure, in which char pointer exists which points to the first character of file.

35.(2) Eccentricity of a given node is the maximum of minimum path from other nodes to the given node.

Cost of minimum path from 1 to 5 is 7.

Cost of minimum path from 2 to 5 is 6

Cost of minimum path from 3 to 5 is 4

Cost of minimum path from 4 to 5 is 7

36.(1) If (1, 3) entry in M3 is 2, it means there are 2 path of length 3, connecting nodes 1 and 3. If you see the graphs in option (1) then we have two paths

$(\rightarrow 2 \rightarrow 3 \rightarrow 3$ & $1 \rightarrow 3 \rightarrow 3 \rightarrow 3)$

37.(1) Start and stop bits are not needed in synchronous transfer of data, so it is 2400/ 8 =300.

38.(4) A constructor is a special member function whose task is to initialize the objects of its class. It is special because its name is same as that of the class.

A destructor is used to destroy the objects that have been created by a constructor.Constructors should be declared in the public section. An object with a constructor or destructor cannot be used as a member of a union. Constructors can never be virtual.

39.(3) When an exception is not caught, the program is aborted. Whenever an exception is generated (in the code which is placed in the 'try' block), it is thrown using a 'throw' statement in the 'try' block which is caught by the 'catch' block where it is handled appropriately.

40.(1) Abstraction is simplification mechanism used to hide superfluous details of a set of objects. It allows one to concentrate on the properties that are of interest to the application.Generalization is the abstraction process of viewing sets of objects as a single general class by concentrating on the general characteristics of the constituent sets while suppressing or ignoring their difference.

Specialization is the abstraction process of introducing new characteristics to an existing class of objects to create one or more new classes of objects.

Aggregation is the process of compiling information on an object, thereby abstracting a higher-level object.

41.(3) Addition in hexadecimal number system is same as other number system. Since hexadecimal number, upto 15(F) are defined, a carry will be generated if addition is larger than F. Another way is to convert the hexadecimal numbers into equivalent binary numbers and then add the numbers.

```
        2  2 2 1      2 0    Carry
        3  B C A .  5 0 7 8
  +     9  E B D .  9 7 F 3
  +     0  5 F B .  E 2 C 0
  ─────────────────────────────
Sum     E  0 8 3 .  C B 2 B
```

Starting from least significant digit

$8 + 3 + 0 = 11_{10} = B16$ (Sum=B Carry=0)

$0 + 7 + F + C = 7_{10} + 15_{10} + 12_{10} = 34_{10} = 22_{16}$ (Sum = 2 Carry= 2)

$2 + 0 + 7 + 2 = 11_{10} = B16$ (Sum =B Carry= 0)

$0 + 5 + 9 + E = 5_{10} + 9_{10} + 14_{10} = 28_{10} = 1C_{16}$ (Sum = C Carry = 1)

$1 + A + D + B = 1_{10} + 10_{10} + 13_{10} + 11_{10} = 35_{10} = 23_{16}$ (Sum = 3 Carry= 2)

$2 + C + B + F = 2_{10} + 12_{10} + 11_{10} + 15_{10} + = 40_{10} = 28_{16}$ (Sum = 8 Carry=2)

$2 + B + E + 5 = 2_{10} + 11_{10} + 14_{10} + 5_{10} = 32_{10} = 20_{16}$ (Sum = 0 Carry=2)
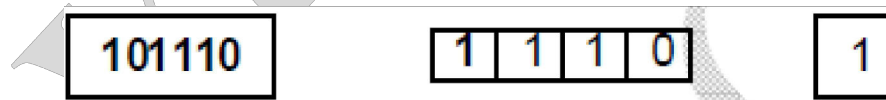
$2 + 3 + 9 + 0 = 14_{10} = E_{16}$ (Sum = E Carry=0)

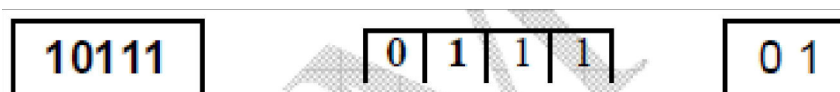**42.(3)** A digital multiplexer can also be used to implement combinational logic function

-True

In a combinational circuit, the current output depends on the previous outputs also -False

43.(1) The content of the register after first shift will be -> 1110 , as

The content of the register after second shift will be -> 0111 , as

44.(4) 32 functions need 5 bit encoding in control memory microinstruction to enable selection of one of the function.

16 data routes need 4 bit encoding in control memory microinstruction to enable selection of one of the data route.

32 – 2 – 8 = 22 independent storing units. Number of control signals, 22 * 2 = 44. Two control signals are needed for two MUXs. Total number of control signals 46 signals for storing input-output register. Since 44 > 2^5, 6 bit encoding is required in control memory microinstruction to enable selection of one of the unit.

16384 (= 214) addresses are there in control memory. 14-bits are thus required from next-address field in the control memory.

Therefore, for all the 4 fields the control memory need (5 + 4 + 6 + 14) encoding bits in each microinstruction.

45.(4) Categories of 8085 instructions that manipulate data:

· STA is a data transfer instruction

· DCR is a arithmetic Instruction

· CMP is a logical Instruction

· CALL is a branch Instruction

46 (2) • ANAR - logical group instructions for 8085- AND accumulator with register

• PCHL - unconditional branch instructions. PCHL instruction exchange the contents of the program counter with the contents of the H and L registers.

• ORAR - logical group instructions for 8085- OR accumulator with register

• CMA - logical group instructions for 8085- Complement the Accumulator

47.(4) The PCI bus is found in all the new Pentium systems as it has plug and play characteristics, has the ability to function with a 64 bit data bus and any micro-processor can be interfaced to it with PCI controller or bridge.

48. (2) ANI stands for "Logical AND with Accumulator Using Immediate Data". This ANDs the accumulator with immediate. F leaves the high nibble whatever it is, 0 clears the lower nibble

49.(3) A transaction manager is the part of an application that is responsible for coordinating transactions across one or more resources. Transaction managers are responsible for ensuring that resources are not left in an inconsistent state, if there is a system failure and the application crashes.

50.(4) Organizational forces, frequency of data access, need for growth and expansion,technological capabilities and need for reliable service are the factors for deciding on database distribution strategies

51.(2) For real-time requirements, store and forward messages for each completed transaction can be broadcast across the network informing all nodes to update data as soon as possible, without forcing a confirmation to the originating node before the database at the originating node is updated. One way to generate such messages is by using triggers. A trigger can be stored at each local database so that when a piece of replicated data is updated, the trigger executes corresponding update commands against remote database replicas.

52.(1) These two statements produce identical results, because it is possible even to use numbers to indicate the column position where Oracle should order the output from a statement.

53.(3) ALTER TABLE statement with ENABLE CONSTRAINT keyword is correct answer to enable an existing constraint.

54.(2) A consistent backup is one in which the files being backed up contain all changes up to the same system change number. This means that the files in the backup contain all the data taken from a same point in time. Unlike an inconsistent backup, a consistent whole database backup does not require recovery after it is restored. An inconsistent backup is a backup of one or more database files that user make while the database is open or after the database has shut down abnormally.

55.(1) Hamming code is error correcting code, to transmit 4 data bits 3 parity bits located at position 2^0, 2^1 & 2^2 from left are added as

$P_1 \, P_2 \, D_3 \, D_4 \, D_5 \, D_6 \, D_7$

When P →Party & D → Data bit

P1 is set to be a or a1 where bits are 1, 3, 5, 7

P2 is set to be a or a1 where bits are 2, 3, 6, 7

P1 is set to be a or a1 where bits are 1, 3, 5, 7

P4 is set to be a or a1 where bits are 4, 5, 6, 7

P_3	P_2	P_1
0	0	0
0	0	1
0	1	0
0	1	1
1	0	0
1	0	1
1	1	0
	1	1

So here

Bits 1, 3, 5, 7 (P1 1 1 1) must be even parity (1).

Bits 2, 3, 6, 7 (P2 1 0 1) must be even parity (0)

Bits 2, 3, 6, 7 (P4 1 0 1) must be even parity (0)

56.(2) WNDCLASS data structure include a pointer to a class() function for handling the window's message.

57.(4) WPARAM is of 32 Bits in win-32 & is not used in handling the message.

58.(3) Unix is also a time shared OS & programs using UNIX can be run on variety of architecture as it assumes to have no knowledge of architectures.

59.(2)

Basic	x_1	x_2	s_1	s_2	s_3	Solution	Ratio
z_1	0	2	1	0	−1	400	200
s_2	0	1	0	1	−2	140	140 →
s_3	1	0	0	0	1	320	
z	0	−4	0	0	6	320	

Entering variable = x2, Leaving variable s2.

Basic	x_1	x_2	s_1	s_2	s_3	Solution	Ratio
s_3	0	0	1/3	2/3	1	40	
s_2	0	1	2/3	−1/3	0	220	
s_1	1	0	−1/3	2/3	0	280	
z	0	0	2/3	8/3	0	2560	

60.(2) $y < x^2 + 2x + 1$
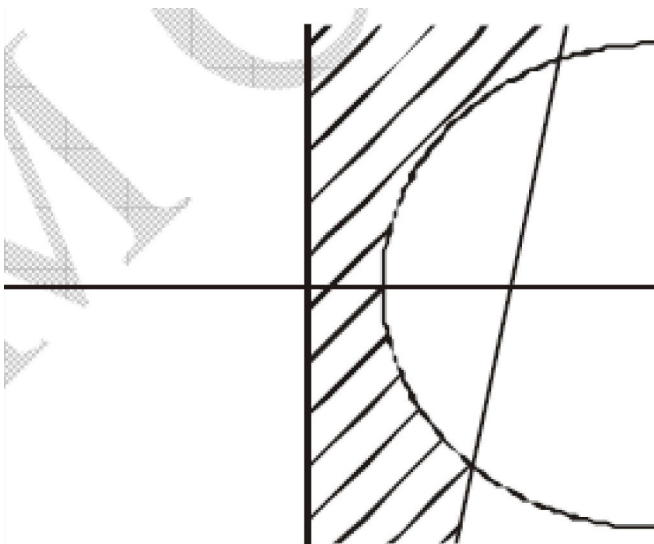
Hence given set is non convex set

61.(2)

x_i	$P(x_i)$	Step 1	Step 2	Step 3	Code
x_1	1/2	0			0
x_2	1/4	1	0		10
x_3	1/8	1	1	0	110
x_4	1/8	1	1	1	111

$I(x_1) = -\log_2 1/2 = 1 = n_1$

$I(x_2) = -\log_2 1/4 = 2 \ n_2$

$I(x_3) = -\log_2 18 = 3 = n_3$

$I(x_4) = -\log_2 1/8 = 3 = n_4$

We know that, $H(X) = \sum_{i=1}^{4} P(x_i)I(x_i)$

Or $\qquad H(X) = \frac{1}{2}(1) + \frac{1}{4}(2) + \frac{1}{8}(3) + \frac{1}{8}(3) = 1.75$

62.(3) A pushdown automation consists of

i. a finite non empty set of states denoted by Q,

ii. a finite non empty set of input symbols denoted by Σ,

iii. a finite non empty set of pushdown symbols denoted by Γ,

iv. a special state called the initial state denoted by q_0,

v. a special pushdown symbol called the initial symbol on the pushdown store denoted by Z_0.

63.(1) In a multiple track TM, a single tape is assumed to be divided into several tracks.Now the tape alphabet is required to consist of k-tuples of tape symbols, k being the number of tracks. Hence the only difference between the standard TM and the TM with multiple tracks is the set of tape symbols.

64.(2) Suppose L is regular. Then, there exists a finite state automation M which accepts L.Suppose M has K states. Let $w = a^k b^k$. Then |w| > k. By the pumping Lemma w = xyz where y is not empty and $w_2 = xy^2z$ is also accepted by M. If y consists of only a' s or only

b's, then w_2 will not have the same number of a's as b's. If y contains both a's and b's, then w_2 will have a's following b's. In either case w_2 does not belong to L, which is a contradiction. Thus L is not regular.

65.(4) Breadth first search are heuristic technique used in medicine, law, biology and chemistry etc.

66.(3) 1. Simple LR (SLR for short), is the easiest to implement, but the least powerful of the three. It may fail to produce a parsing table for certain grammars on which the other methods succeed.

2. Canonical LR is the most powerful and the most expensive.

3. Look ahead LR (LALR for short), is intermediate in power and cost between the other two. The LALR method will work on most programming-language gram-

mars and,with some effort, can be implemented efficiently

67.(3) Deletion and insertion of elements is not required in binary search.

68.(2) Dependency preserving is not condition for BCNF.

69.(1) In key dependencies as in Functional dependencies there is the dependency of keys.

70.(1) The network of the given figure is a single layer feed-forward neural network because there is only one neuron between any input and output. The network is not autoassociative i.e. doesn't have feedback because there are no loops in it.

71.(2).The top square of the output is black because the top pattern differs in two squares from a T and in 3 squares from an H. The middle square is not defined because the middle row of the input defers the same amount from both T and H(differs in 1). Therefore, the output can be either black or white.The bottom square is black because it differs from a T and in 2 from an H

72.(2) ICMP is the Internet control Message protocol. It is an application layer protocol. It is used by hosts, routers, & gateways to communicate network layer information to each other. The most typical use of ICMP is for error reporting.

73.(3) For processing an output in XML, "new line" symbol are first converted to single LF symbol.

74.(2) If you want to open a link in a new browser then it will be opened with <a href = "url" target ="-blank"> syntax.

75.(2) <Script type = "text/javascript"></jscript> using this tag , we insert a javascript in HTTH page. In all project this can be used.

76.(4) The transportation method does not work if hiring and layoff is possible. This is an aggregate method.

77.(1) Eight phase digital transmission implies 23 bits/second. Hence, the bit rate can be tripled over corresponding two phase modulation.
Multi mode fiber allows more than one ray of light at a moment. It is generally greater in diameter than a single mode fiber.

78.(3) If the M bit in X.25 standard is set to 1, it means that there is more than one packet.The M-bit or More Data indicates whether this particular packet is carrying the total intended message or whether there is more data to follow as part of this transmission.

79.(1) Multiplexing is sharing of communication channel. Multiplexing involves multiple signals or streams of information on a carrier at the same time in the form of a single, complex signal. 10Base2 cabling is also popularly known as thin Ethernet. It supports transmission up to a maximum distance of 20mts. Such Cables are cheaper and used for smaller lowcost LAN's.

Frequency hopping and spread spectrum techniques are involved in transmission. Spread Spectrum is the wide range of frequencies during transmission.

Time Domain Reflectometry is a technique that detects cable breaks, bad taps or loose connectors. The TDR measures the time it takes for the signal to travel down the cable and reflect back. The TDR then converts this time to distance and displays the information as a waveform and/or distance reading.

80.(2) Use the formula
$$N = \frac{1+L}{(T-\delta)}$$

Here T = 5 μsecs

L = 25 μsec, and

D = 2.73 μsec.

Putting the values and solving, we get

N = 12.01 which round down to 12 cells.

81.(3) We arbitrarily choose A as our starting node and consider all branches incident on it;they are AE, AB, AD, and AC, with costs 10, 2, 1, and 4 respectively. Since AD is the cheapest, we add this branch to the solution, as shown in Fig.(1) Nodes A and D are now connected.

We next consider all branches incident on either A or D that connect to other nodes.Such branches are AE, AB, AC, DB, DE, DF, DG, and DC, with costs 10, 2, 4, 1, 7, 10, 7,and 4, respectively. Since DB is the cheapest to include, we adjoin it to Fig-(1) and obtain Fig-(2). The connected nodes are now A, B, and D.

(a)

(b)

(c)

(d)

(e)

(f)
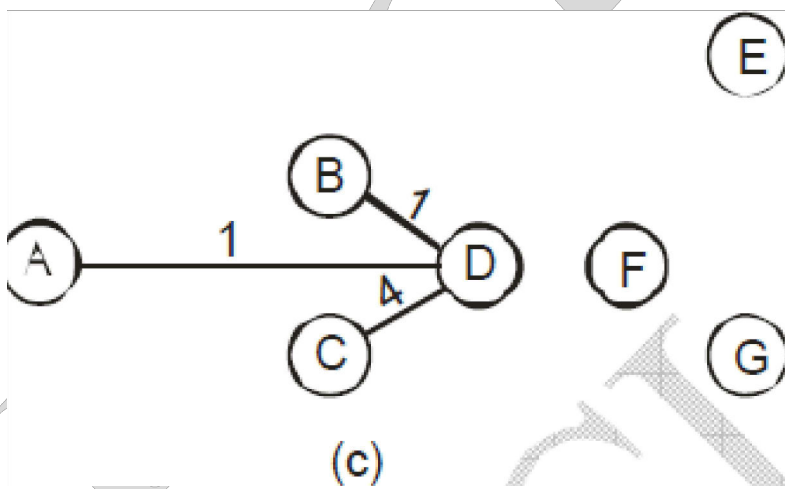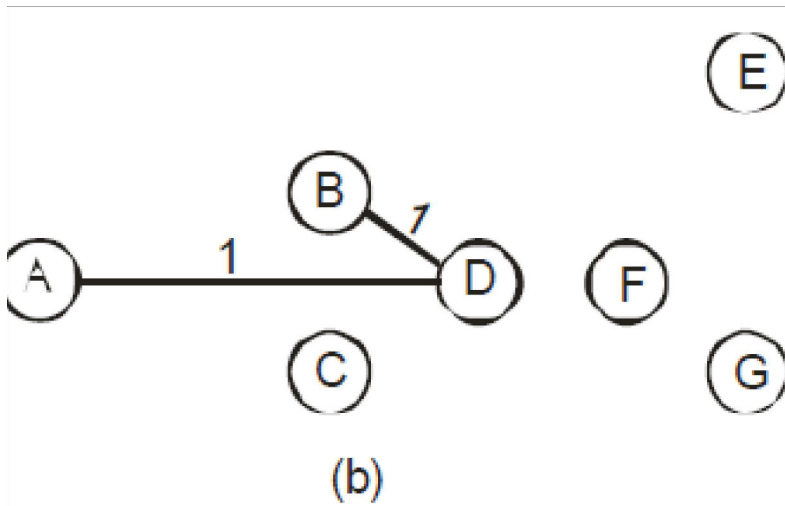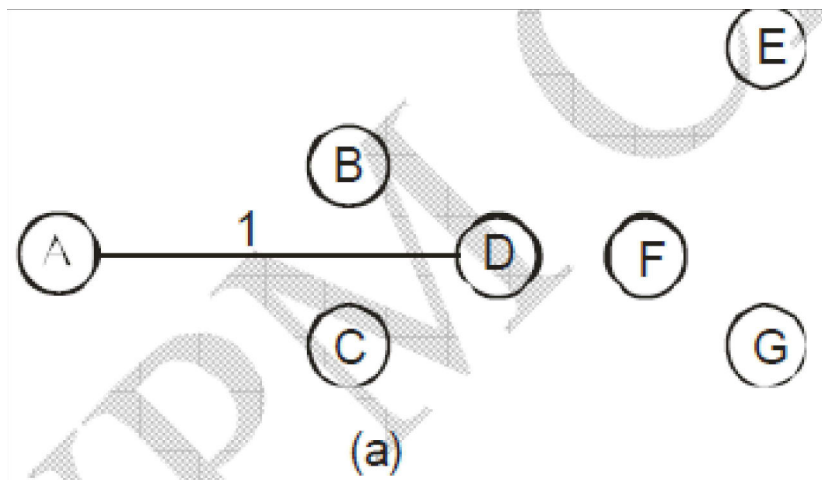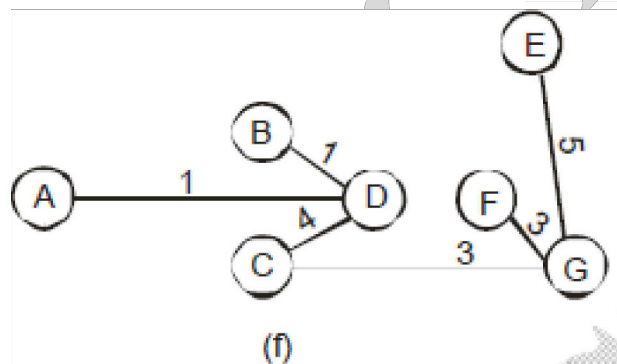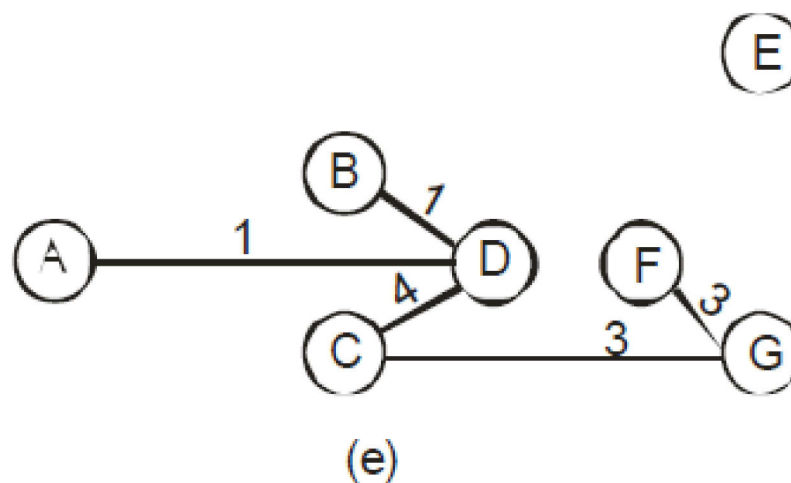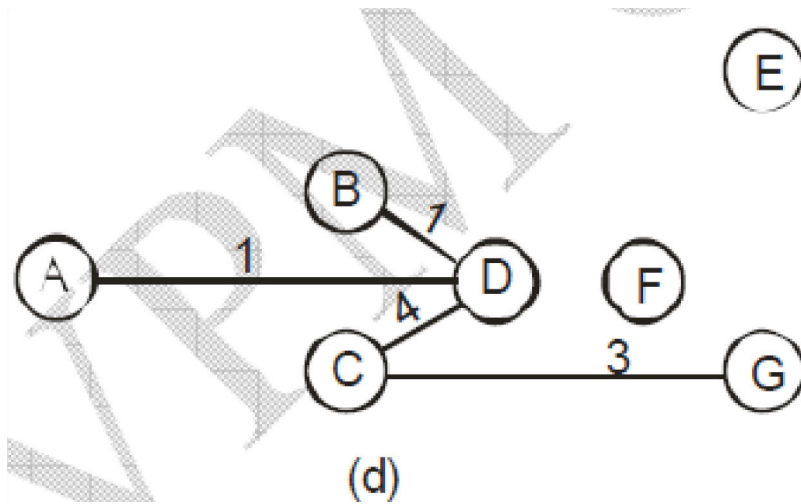
We next consider all branches incident on A, B, or D that connect to other nodes. These are AE, AC, DE, DF, DG, with costs 10, 4, 7, 10, 7, and 4. The cheapest branch of interest is either AC or DC. We arbitrarily select DC and adjoin it to Fig. (2) to obtain Fig-(3).

Continuing in this manner, we obtain sequentially Fig-(4) through Fig(f). Fig(f) contains all the nodes; hence it is a minimal-span network. The minimum cost for connecting the network is $Z^* = 1 + 1 + 4 + 3 + 3 + 5 = 17$

82.(4) Given derivation is neither leftmost nor rightmost derivation because this is not restricted for left-right recursion/replacement.

83.(2) (r*s*)* = (r + s)* = (r* + s*)* this is the one of the identity from the 12 identities of regular grammar.

84.(1) A grammar is called left most grammar if and only if all steps involved in derivation have leftmost variable replacement only. From the definition it is clear that for the given grammar option (1) is correct.

85.(3) A self relocating program is one which can itself perform the relocation of its address-sensitive portions.

86.(2) The basic principle behind the structured design methodology in problem partitioning the four major steps are
   1. Restate the problem
   2. Identify the input and output
   3. First level factoring
   4. Factoring of input, output and transform branches.

87.(3) None of the given statements are true.

88.(4) Areas of application of software metrics are :
   1. Prediction of quality levels for software in terms of reliability
   2. Cost and size estimation techniques
   3. Controlling software development projects through measurement.

89.(2) Lists in PROLOG constitute elements separated by commas and enclosed within square brackets. The elements could comprise of any data type.
   eg – [2, 4, 8, 10, 12] and ['jack', 'jill', 'jane' 1]

90.(1) p:-a, b, c

   p:-d, e, f ,

   This represents the control structure in PROLOG. Given representation means that p is true if either (a and b and c) is true or (d and e and f) is true the comma implies an AND.

91.(2) Arity is the number of arguments in a predicate form. It is represented by a/n placed after the predicate name. n is the number of arguments for instance the predicate relishes/2 takes two arguments.

92.(3) Some of the important standards for providing structure to multimedia applications are–

1. MHEG
2. PREMO
3. ODA
4. Acrobat
5. Hytime
6. SGML

93.(1) The steps involved in the animation are-

(i) Storyboard layout

(ii) Object definitions

(iii) Keyframe specifications

(iv) Generation of in-between frames

94.(2) Parameterized systems allow object motion characteristics to be specified as part of the object definitions. The adjustable parameters control such object characteristics as degrees of freedom, motion limitations and allowable shape changes.

95.(2) All (1), (3) and (4) are false. The difference between (2) and (3) is vital.

80386 processor has 32 bit address capacity (32 pins for address) hence it its capable of accessing $2^{32} = 2^2 \times 2^{30} = 4GB = 4096$ MB of main memory. Present day computers have atmost 32 MB RAM. The address space of 386 processor is 4GB and hence virtual memory can be atmost 4 GB. If a program is of 5 GB, we have to use only overlying technique.

96.(3) Monitoring shell commands is an example of anomaly detection. Monitoring shell

commands is used to detect anomalous commands for a given user or detecting an anomalous login time for a user.

97.(2) Option (2) gives the correct O/P for the program

98.(3) Readability – Programs written in high level languages are more readable than assembly and machine language.Portability – Programs could be run on different machines with little or no change.

99.(2) A PROLOG program comprises a description of the problem using a number of facts and rules. Matching in PROLOG is performed predicate to predicate and argument to argument.

100.(2) Option B is correct. Most of the operations associate to the left because of the way keystrokes are processed from left to right.