उम्मीदवार इस पुस्तिका के सबसे ऊपरी सील को खोलकर पृष्ठ संख्या 2 और 3 के मध्य स्थापित OMR उत्तर शीट को निकाल लें।
Candidates should open the top side of the seal of this Booklet and take out the OMR Answer Sheet placed at page no. 2 and 3.

पुस्तिका सं. :
Booklet No. :

SB-CS

परीक्षा प्रश्न-पुस्तिका / **EXAMINATION QUESTION BOOKLET**

परीक्षा पुस्तिका श्रृंखला :
Test Booklet Series : **A**

COMPUTER SCIENCE

निर्धारित समय : 180 मिनट
Time Allowed : 180 Minutes

अधिकतम अंक : 120
Maximum Marks : 120

रोल नं.
Roll No. :

उत्तर शीट सं.:
Answer Sheet No. :

प्रश्नों के उत्तर देने से पहले निम्नलिखित अनुदेशों को ध्यान से पढ़ लें। / Read the following instructions carefully before you begin to answer the questions.

उम्मीदवारों के लिए अनुदेश

1. प्रश्नों के उत्तर लिखना आरंभ करने से पहले आप इस पुस्तिका की जाँच करके सुनिश्चित कर लें कि इसमें पूरे पृष्ठ (1-16) हैं तथा कोई पृष्ठ या उसका भाग कम या दुबारा तो नहीं आ गया है। उम्मीदवारों को यह भी जाँच करनी है कि उनको केवल उस स्ट्रीम की सही परीक्षा-पुस्तिका मिली है जिसके लिए उन्होंने आवेदन किया है और जो उनके Admit Card में छपा है अर्थात् कंप्यूटर साइंस या सूचना प्रोद्योगिकी या इलेक्ट्रॉनिक्स। यदि आप इस पुस्तिका में कोई त्रुटि पाएं, तो ***तत्काल*** इसके बदले दूसरी पुस्तिका ले।
2. **ओएमआर उत्तर-शीट प्रश्न पुस्तिका में ही उपलब्ध रहेगी। कृपया सुनिश्चित करें कि ओएमआर शीट संख्या और परीक्षण पुस्तिका संख्या समान हैं। ओएमआर शीट पर जानकारी भरने से पहले ओएमआर शीट पर छपे निर्देशों को ध्यान से पढ़ें। आपको ओएमआर उत्तर-पत्रक पर सभी विवरणों को सही ढंग से पूरा और कोड करना होगा, ऐसा न करने पर आपकी उत्तर पुस्तिका का मूल्यांकन नहीं किया जा सकता है। प्रश्नों का उत्तर देना शुरू करने से पहले आपको ओएमआर उत्तर-पत्रक पर दिये गए निर्धारित स्थान पर अपने हस्ताक्षर करने होंगे। इन निर्देशों का पूर्ण रूप से पालन किया जाना चाहिए, ऐसा न करने पर आपकी ओएमआर उत्तर-पुस्तिका का मूल्यांकन नहीं किया जा सकता है।** (दृष्टिहीन उम्मीदवारों के लिए यह विवरण लेखक द्वारा भरे जायेंगे। फिर भी, सभी दृष्टिहीन उम्मीदवारों को ओएमआर उत्तर-शीट में निर्धारित स्थान पर अपने बाएं हाथ के अंगूठे का निशान अवश्य लगाना चाहिए। इसके अतिरिक्त, जो दृष्टिहीन उम्मीदवार अपना हस्ताक्षर कर सकते हैं, वे अंगूठे के निशान के अलावा अपने हस्ताक्षर भी करें।)
3. ओएमआर उत्तर-शीट तीन प्रतियों में होंगी (मूल तथा कार्बन की दो प्रतिलिपियाँ)। परीक्षा समाप्ति के बाद ओ.एम्.आर. की मूल शीट तथा एक कार्बन प्रतिलिपि निरीक्षक को सौंपने के पश्चात् उम्मीदवार अपने साथ एक कार्बन प्रतिलिपि ले जा सकते/सकती हैं। यदि कोई भी उम्मीदवार ऐसा करने में असफल रहता/रहती है तो उसकी उम्मीदवारी रद्द कर दी जायेगी। यदि कोई उम्मीदवार अपनी कार्बन प्रतिलिपि में किसी भी प्रकार का फेर-बदल कर उसका दावा करता/ करती है तो इस स्थिति में भी उसका/उसकी उम्मीदवारी रद्द की जायेगी।
4. इस प्रश्न-पुस्तिका में **120** बहुविकल्पीय प्रश्न हैं। प्रत्येक प्रश्न के 4 विकल्प दिए गए हैं, (A), (B), (C) और (D)। किसी भी स्थिति में प्रत्येक प्रश्न का केवल एक विकल्प ही सही उत्तर है। यदि आपको एक से अधिक विकल्प सही लगें तो सबसे अधिक उचित एक विकल्प का चुनाव करें और उत्तर शीट में सम्बंधित प्रश्न के सामने वाले उपयुक्त गोले को काला करें।
5. प्रश्न पुस्तिका में दो भाग हैं : भाग A : सामान्य (42 प्रश्न) और भाग B : तकनीकी (78 प्रश्न)। उम्मीदवार को दोनों भागों के उत्तर लिखना अनिवार्य हैं।
6. प्रत्येक **सही** उत्तर के लिए 1 अंक दिया जाएगा **और प्रत्येक गलत उत्तर के लिए 0.25 अंक काट लिया जाएगा।**
7. गोले को काला करने के लिए केवल काले/नीले बॉल प्वाइंट पेन का प्रयोग करें। गोले को एक बार काला करने के बाद इसको मिटाने या बदलने की अनुमति नहीं है। यदि किसी प्रश्न के सामने एक से ज्यादा गोले काले किये गए हों तो मशीन द्वारा उसके लिए **शून्य अंक** दिया जाएगा।
8. किसी भी स्थिति में उत्तर शीट को न मोड़ें।
9. उत्तर-पुस्तिका पर कोई भी रफ कार्य नहीं करना है। रफ कार्य के लिए इस पुस्तिका में स्थान दिया गया है।
10. परीक्षा हॉल/कमरों में मोबाइल फ़ोन तथा बेतार संचार साधन पूरी तरह निषिद्ध हैं। उम्मीदवारों को उनके अपने हित में सलाह दी जाती है कि मोबाइल फ़ोन/किसी अन्य बेतार संचार साधन को स्विच ऑफ करके भी अपने पास न रखें। इस प्रावधान का अनुपालन न करने को परीक्षा में अनुचित उपायों का प्रयोग माना जायेगा और उनके विरुद्ध कार्यवाही की जाएगी, जिसमें उनकी उम्मीदवारी रद्द करना भी शामिल है।
11. **अभ्यर्थी अपनी उत्तर पुस्तिका पर्यवेक्षक को सौंपे बिना और अपने रोल नंबर के सामने उचित स्थान पर उपस्थिति पत्रक पर हस्ताक्षर किए बिना परीक्षा हॉल/कक्ष से बाहर नहीं जा सकता। इसके अलावा अभ्यर्थी को उपस्थिति पत्रक पर हस्ताक्षर करने से पहले यह भी सुनिश्चित करना चाहिए कि बुकलेट नंबर, बुकलेट सीरीज और ओएमआर उत्तर पुस्तिका संख्या सही ढंग से लिखी गई हो। ऐसा ना करने पर, ओएमआर उत्तर पुस्तिका को अमान्य माना जाएगा/मूल्यांकन नहीं किया जा सकता है।**

Instructions to the Candidates

1. Before you start to answer the questions you must check this booklet and ensure that it contains all the pages (1-16) and see that no page or portion thereof is missing or repeated. Candidates are also required to check that they have got the right question booklet strictly from the stream candidate has applied for and printed on the Admit Card i.e. Computer Science OR Information Technology OR Electronics. If you find any defect in this Booklet, you must get it replaced ***immediately***.
2. **OMR Answer-Sheet is within the Question Booklet. Please ensure OMR Answer-Sheet number and Test Booklet No. of Question Paper are same. Read the instructions printed on OMR Answer-Sheet carefully before filling the information on the OMR Answer-Sheet. You must complete and code all the details on the OMR answer sheet correctly failing which your answer sheet may not be evaluated. You must also put your signature on the OMR Answer-Sheet at the prescribed place before you actually start answering the questions. These instructions must be fully complied with, failing which, your OMR Answer-Sheet may not be evaluated.** (For V.H. candidates these details will be filled in by the scribe. However, all V.H. candidates must put their left-hand thumb impression at the space provided in the OMR Answer-Sheet. In addition, those V.H. candidates who can sign should also put their signatures in addition to thumb impression.)
3. The OMR Answer-Sheet will be in triplicate (Original and two carbon copies). Candidate has to take one carbon copy (marked as 'candidate copy') with him/her after examination and handover the original OMR along with one carbon copy to invigilator. If candidate fails to handover the original OMR along with one carbon copy to invigilator, his /her candidature will be cancelled. Further, if the candidate tampers with candidate OMR carbon copy and claims for same, in that case also his/her candidature will be cancelled.
4. This booklet consists of **120** Multiple Choice Questions. Each question has 4 (four) alternatives (A), (B), (C) and (D). In any case only one alternative will be the correct answer. In case if you find more than one correct answer, then choose the most appropriate single option and darken the appropriate circle in the answer sheet in front of the related question.
5. Question Booklet consists of two parts : Part A : Generic (having 42 questions) and Part B : Technical (having 78 questions). Candidates has to attempt both parts compulsorily.
6. For each **correct** answer One mark will be given and **for each incorrect answer 0.25 marks will be deducted.**
7. Use Black/Blue ball point Pen to darken the circle. Answer once darkened is not allowed to be erased or altered. Against any question if more than one circle is darkened, machine will allot **zero mark** for that question.
8. Do not fold answer sheet in any case.
9. No rough work is to be done on the Answer-Sheet. Space for rough work has been provided in this booklet.
10. Mobile phones and wireless communication devices are completely banned in the examination hall/rooms. Candidates are advised not to keep mobile phones/any other wireless communication devices with them even switching it off, in their own interest. Failing to comply with this provision will be considered as using unfair means in the examination and action will be taken against them including cancellation of their candidature.
11. **Candidate should not leave the examination hall / room without handing over his/her Answer-Sheet to the invigilator and without signing on the attendance sheet at proper place against your roll number, further candidate should also ensure that booklet no., booklet series and OMR Answer-Sheet No. are correctly written on attendance sheet before signing on it, failing in doing so, may lead to disqualification / no evaluation of OMR Answer-Sheet.**

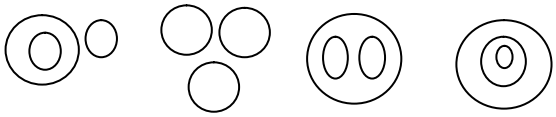
जब तक आपसे कहा न जाए तब तक प्रश्न-पुस्तिका न खोलें / DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

उम्मीदवार का नाम/**Name of Candidate :** _____ उम्मीदवार के हस्ताक्षर/**Signature of Candidate :** _____

PART - A

GENERIC

Directions (1-2) : Use following diagrams to answer question number 1 to 2 :



(I) (II) (III) (IV)

1. Cloud, River, Mountain :

(A) II (B) I

(C) IV (D) III

2. Oxygen, Atmosphere, Nitrogen :

(A) II (B) I

(C) IV (D) III

Directions (3-5) : In each of the following questions, one number is wrong in the series. Find out the wrong number.

3. 3, 5, 12, 39, 154, 772, 4634 :

(A) 5 (B) 3

(C) 39 (D) 154

4. 1, 9, 25, 49, 86, 121 :

(A) 25 (B) 121

(C) 166 (D) 86

5. 701, 348, 173, 85, 41, 19, 8 :

(A) 173 (B) 41

(C) 19 (D) 348

6. Rakesh is standing at a point. He walks 20 m towards the East and further 10 m towards the South, then he walks 35 m towards the West and further 5 m towards the North, then he walks 15 m towards the East. What is the straight distance in metres between his starting point and the point where he reached last ?

(A) 0 (B) 5

(C) 10 (D) 15

Directions (7 - 8) : In the given questions below, a statement is given followed by two conclusions numbered I and II. You have to take the statement to be true. Read both the conclusions and decide which of the two or both follow from the given statement. Give answer :

(A) If only conclusion I follows.

(B) If only conclusion II follows.

(C) If either I or II follows.

(D) If neither I nor II follows.

7. The top management has asked the four managers either to resign by tomorrow or face the order of service termination. Three of them have resigned till this very evening.

I The manager who did not resign yesterday will resign tomorrow.

II The management will terminate the service of one manager.

8. A study of planning commission reveals boom in revenues. However, this has been of little avail owing to soaring expenditure. In the event, there has been a high dose of deficit financing, leading to marked rise in prices. Large financial outlays year after year had little impact on level of living.

I A boom in revenues leads to rise in prices.

II Large financial outlays should be avoided.

Directions (9-13) : Read the information given below and on the basis of the information, select the correct alternative for each question given after the information.

There are five persons P, Q, R, S and T. One is football player, one is chess player, one is hockey player. P and S are unmarried ladies and do not participate in any game. None of the ladies plays chess or football. There is a married couple in which T is the husband. Q is the brother of R and is neither a chess player nor a hockey player.

9. Which of the following is the correct group of ladies ?

(A) P, Q and R (B) Q, R and S

(C) P, Q and S (D) P, R and S

10. Who is the football player ?

(A) Q (B) R

(C) S (D) T

11. Who is the hockey player ?

(A) T (B) S

(C) R (D) Q

12. Who is the wife of T ?

(A) Q

(B) R

(C) S

(D) None of these

13. Who is the chess player ?

(A) Q (B) R

(C) S (D) T

Directions (14-18) : Read the information given below and on the basis of the information, select the correct alternative for each question given after the information.

M and N are good at hockey and volleyball. O and M are good at hockey and baseball. P and N are good at cricket and volleyball. O, P and Q are good at football and basketball.

14. Who is good at cricket, volleyball and hockey ?

(A) Q (B) P

(C) O (D) N

15. Who is good at baseball, hockey and volleyball ?

(A) Q (B) P

(C) O (D) M

16. Who is good at the largest number of games ?

(A) Q (B) P

(C) O (D) N

17. Who is good at cricket, baseball and volleyball ?

(A) Q (B) P

(C) O (D) N

18. Who among the following is good at four games ?

(A) Q (B) P

(C) O (D) M

Directions (19-21) : Read the information given below and on the basis of the information, select the correct alternative for each question given after the information.

(i) Six flats on a floor in two rows facing North and South are allotted to P, Q, R, S, T and U.

(ii) Q gets a north facing flat and is not next to S.

(iii) S and U get diagonally opposite flats.

(iv) R next to U, gets a south facing flat and T gets a north facing flat.

19. Whose flat is between Q and S ?

(A) T (B) U

(C) R (D) P

20. If the flats of T and P are interchanged, who's flat will be next to that of U ?

(A) Q (B) T

(C) P (D) R

21. The flats of which of the other pairs than SU, is diagonally opposite to each other ?

(A) PT (B) PQ

(C) QR (D) TS

22. A factory employs skilled workers, unskilled workers and clerks in the proportion 8 : 5 : 1, and the wages of a skilled worker, an unskilled worker and a clerk are in the ratio 5 : 2 : 3. When 20 unskilled workers are employed, the total daily wages of all (skilled workers, unskilled workers and clerks) amount to ₹ 318. The wages paid to each category of workers are :

(A) ₹ 240, ₹ 60, ₹ 18

(B) ₹ 200, ₹ 90, ₹ 28

(C) ₹ 150, ₹ 108, ₹ 60

(D) ₹ 250, ₹ 50, ₹ 18

23. The students in a class are seated according to their marks in the previous examination. Once it so happens that four of these students get equal marks and therefore the same rank. To decide their seating arrangement, the teacher wants to write down all possible arrangements, one in each of separate bits of paper, in order to choose one of these by lots. How many bits of paper are required ?

(A) 9 (B) 12

(C) 15 (D) 24

24. In a mixture of 60 L, the ratio of milk and water is 2 : 1. If the ratio of milk and water is to be 1 : 2, then the amount of water to be further added must be :

(A) 40 L (B) 30 L

(C) 20 L (D) 60 L

25. Instead of walking along two adjacent sides of a rectangular field, a boy took a short cut along the diagonal and saved a distance equal to half the longer side. Then, the ratio of the shorter side to the longer side is :

(A) 1/2 (B) 2/3

(C) 1/4 (D) 3/4

26. In a parallelogram ABCD, AP and BP are the angle bisectors of $\angle DAB$ and $\angle ABC$. Find $\angle APB$:

(A) 85° (B) 90°

(C) 94° (D) 86°

27. In a fraction, numerator is increased by 25% and the denominator is diminished by 10%. The new fraction obtained is 5/9. The original fraction is :

(A) 2/5

(B) 5/9

(C) 3/5

(D) None of the above

28. $\frac{1}{2}\log_{10} 25 - 2\log_{10} 3 + \log_{10} 18$ equals :

(A) 18

(B) 1

(C) $\log_{10} 3$

(D) None of these

29. If $x = p$, $y = q$ then which of following are p and q respectively for pair of equations $3x - 7y + 10 = 0$ and $y - 2x - 3 = 0$:

(A) $-1, 1$ (B) 1, 1

(C) 1, 0 (D) 0, 1

30. A cylindrical vessel 60 cm in diameter is partially filled with water. A sphere 30 cm in a diameter is dropped into it. The increase in the level of water in the vessel is :

(A) 2 cm (B) 3 cm

(C) 4 cm (D) 5 cm

31. A, B and C rented a pasture by paying ₹ 2160 per month. They put 60, 40 and 20 sheep respectively. A sells 1/3 of his sheep to B after 6 months and after 3 months more C sells 2/5 of his sheep to A. Find the rent paid by C at the end of the year :

(A) ₹ 4355 (B) ₹ 3888

(C) ₹ 2464 (D) ₹ 6224

32. A cuboid of dimension 24 cm × 9 cm × 8 cm is melted and smaller cubes of side 3 cm are formed. Find how many such cubes can be formed :

(A) 27 (B) 64

(C) 54 (D) 32

Directions (33-34) : Read the information given below and on the basis of the information, select the correct alternative for each question given after the information.

YEAR	RURAL		SEMI-URBAN		STATE CAPITAL		METROPOLITAN	
	App	Pass	App	Pass	App	Pass	App	Pass
2015	1652	208	7894	2513	5054	1468	9538	3214
2016	1839	317	8562	2933	7164	3248	10158	4018
2017	2153	932	8139	2468	8258	3159	9695	3038
2018	5032	1798	9432	3528	8529	3628	11247	5158
2019	4915	1668	9784	4015	9015	4311	12518	6328
2020	5628	2392	9969	4263	10725	4526	13624	6449

*App - Appeared *Pass - Passed

33. What approximate value was the percentage drop in the number of semi-urban candidates appeared from 2016 to 2017 ?

(A) 15 (B) 10

(C) 5 (D) 8

34. In which of the following years was the percentage passed to appeared candidates from semi-urban area the least ?

(A) 2015 (B) 2016

(C) 2017 (D) 2018

35. He was not only accused of theft _____ of conspiracy.

(A) rather (B) but also

(C) but even (D) rather than

36. "The dress _____ him so well that she immediately _____ him on his appearance." The words that best fill the blanks in the above sentence are :

(A) complemented, complemented

(B) complimented, complemented

(C) complimented, complimented

(D) complemented, complimented

Each of these questions (37-38) has an idiomatic expression followed by four options. Choose the one closest to its meaning.

37. Talk shop :

(A) Talk about once profession

(B) Talk about shopping

(C) Ridicule

(D) Treat lightly

38. Stick to once guns :

(A) remain faithful to the cause

(B) suspect something

(C) make something fail

(D) be satisfied

39. Identify the correct spelling out of the given options :

(A) Managable (B) Manageable

(C) Mangaeble (D) Managible

40. "Going by the _____ that many hands make light work, the school _____ involved all the students in the task." The words that best fill the blanks in the above sentence are :

(A) principle, principal

(B) principal, principle

(C) principle, principle

(D) principal, principal

41. Which of the following options is the closest in meaning to the word below ?
DELETERIOUS

(A) delaying (B) glorious

(C) harmful (D) graduating

42. The fisherman, _____ the flood victims owed their lives, were rewarded by the govt.

(A) whom (B) to which

(C) to whom (D) to that

PART - B
TECHNICAL

43. Write Recurrence of Quick Sort in worst case.

(A) $T(n) = T(n-1) + 1$

(B) $T(n) = T(n-1) + n$

(C) $T(n) = 2T(n-1) + n$

(D) $T(n) = T(n/3) + T(2n/2) + n$

44. $y = 10 \cos (1800\ \pi t) + 20 \cos (2000\ \pi t) + 10 \cos (220\ \pi t)$. Find the modulation index (μ) of the given wave.

(A) 0.3 (B) 0.5

(C) 0.7 (D) 1

45. Match the following :

	List - I		List - II
W.	Condition coverage	1.	Black-box testing
X.	Equivalence class partitioning	2.	System testing
Y.	Volume testing	3.	White-box testing
Z.	Alpha testing	4.	Performance testing

(A) W-2, X-3, Y-1, Z-4

(B) W-3, X-4, Y-2, Z-1

(C) W-3, X-1, Y-4, Z-2

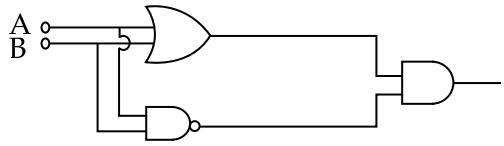
(D) W-3, X-1, Y-2, Z-4

46. _____ is the class of decision problems that can be solved by non-deterministic polynomial algorithms.

(A) NP (B) P

(C) Hard (D) Complete

47. The following circuit depicts the implementation of _____.



(A) XOR Gate (B) AND Gate

(C) OR Gate (D) NAND Gate

48. The following type definition is for a _____.

```
type pointer = ↑node
     node = record
          data : integer
          link : pointer

     end;
```

(A) Structure

(B) Link List

(C) Stack

(D) Doubly link list

49. Let $P(x)$ be "x is perfect", $F(x)$ be "x is your friend" and the domain be all people. The statement, "At least one of your friends is perfect" is :

(A) $\forall x\ (F(x) \rightarrow P(x))$

(B) $\forall x\ (F(x) \wedge P(x))$

(C) $\exists x\ (F(x) \wedge P(x))$

(D) $\exists x\ (F(x) \rightarrow P(x))$

50. When factorizing the Boolean equation $Y = A\overline{B} + AB$, the result will be :

(A) $A\overline{B}$ (B) AB

(C) A (D) B

51. The _____ of a relationship is 0 if there is no explicit need for the relationship to occur or the relationship is optional.

(A) modality

(B) cardinality

(C) entity

(D) structured analysis

52. A language L is recognizable by a turing machine M if and only if L is a _____ language.

(A) Type 0 (B) Type 1

(C) Type 2 (D) Type 3

53. The _____ enables the software engineer to develop models of the information domain and functional domain at the same time.

(A) data flow diagram

(B) state transition diagram

(C) control specification

(D) activity diagram

54. An analog signal having 3 kHz bandwidth is sampled at 1.5 times the Nyquist rate. The successive samples are statistically independent. Each sample is quantized into one of 256 equally likely levels. The information rate of the source is :

(A) 3 kbps (B) 72 kbps

(C) 256 kbps (D) 9 kbps

55. 100 elements can be sorted in 100 sec using bubble sort. In 400 sec, approximately _____ elements can be sorted.

(A) 100 (B) 200

(C) 300 (D) 400

56. The maximum number of times the decrease key operation performed in Dijkstra's algorithm will be equal to _____.

(A) Total number of vertices

(B) Total number of edges

(C) Number of vertices -1

(D) Number of edges -1

57. _____ is the elapsed time between the time a program or job is submitted and the time when it is completed.

(A) Response time

(B) Turnaround time

(C) Waiting time

(D) Throughput

58. The determinant of matrix $\begin{bmatrix} 0 & p-q & p-r \\ q-p & 0 & q-r \\ r-p & r-q & 0 \end{bmatrix}$ is _____.

(A) 0

(B) $(p-q)(q-r)(r-p)$

(C) pqr

(D) $3pqr$

59. A wireless network interface controller can work in _____.

(A) infrastructure mode

(B) ad-hoc mode

(C) both infrastructure mode and ad-hoc mode

(D) WDS mode

60. ABC * + is the postfix form of :

(A) A * B + C (B) A* + BC

(C) A + B * C (D) none of these

61. If developer wants to transform model into source code is also known as_____.

(A) Backward Testing/Engineering

(B) Forward Engineering

(C) Forward Testing

(D) Reverse Engineering

62. The number of 4 digit numbers which contain not more than two different digits is :

(A) 576 (B) 567

(C) 513 (D) 504

63. In Software Modeling 'IS A' represents _____ relationship.

(A) Aggregation

(B) Over loading

(C) Inheritance

(D) Design Patterns

64. The operating system stores an _____ in order to decide to which user to grant which access rights to which file ?

(A) File allocation table

(B) Process control block

(C) Access control matrix

(D) File control matrix

65. Assume that a DBA issued the following create table command :

create table A (Aid, ……)

storage (initial 20480, next 20480,

maxextents 8, minextents 3, pctincrease 0);

How many bytes of disk space will be allocated to this file when it is first created ?

(A) 163,840 bytes

(B) 20480 bytes

(C) 61,440 bytes

(D) 8 bytes

66. Dijkstra's Algorithm cannot be applied on _____.

(A) Directed and weighted graphs

(B) Graphs having negative weight function

(C) Unweighted graph

(D) Undirected and unweighted graphs

67. The channel capacity of a noise free channel having M symbols is given by :

(A) M

(B) 2^M

(C) log M

(D) None of these

68. Which type of illustration lists the functionality of whole project ?

(A) DFD-0

(B) Class Diagram

(C) Use case Diagram

(D) State Diagram

69. If the size of the logical address space is 2^m and the page size is 2^n addressing units, then the high order m-n bits of a logical address designate the _____.

(A) offset

(B) page no

(C) frame no

(D) physical address

70. A bottom-up parser generates _____.

(A) Rightmost derivation

(B) Rightmost derivation in reverse

(C) Leftmost derivation

(D) Leftmost derivation in reverse

71. Let the random variable X has a mixed distributions with probability $P(X=0)=\alpha$, and the density function.

$$f_x(x) = \begin{cases} \beta x^2(1-x), 0 < x < 1 \\ 0, \text{otherwise} \end{cases}$$

If the expectation of X is α, then the value of $4\alpha+\beta$ is equal to :

(A) 9/2 (B) 6

(C) 9 (D) 5/2

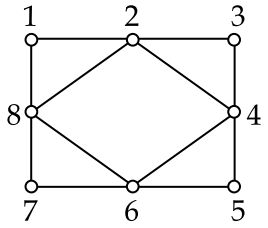
72. What is the value of $f(4)$ using the following C code :

```
int f (int k) {
        if (k < 3)
        return k;
else
        return f (k-1) * f (k-2) + f (k-3);
                }
```

(A) 5 (B) 6

(C) 7 (D) 8

73. What will be the Eulerian tour of the following graph G ?



G

(A) 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 6 – 4 – 2 – 8 – 1

(B) 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8

(C) 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 1

(D) 8 – 7 – 6 – 5 – 4 – 3 – 2 – 1

74. DELETE [FROM] table [WHERE condition]; from the syntax if you omit the WHERE clause.

(A) All rows in the table are deleted.

(B) It will give you an error.

(C) No rows will be deleted.

(D) Only one row will be deleted.

75. What is WPA ?

(A) wi-fi protected access

(B) wired protected access

(C) wired process access

(D) wi-fi process access

76. In a paging scheme if page size is of 2048 bytes, then while accommodating a process of 72, 766 bytes, how much internal fragmentation occurs ?

(A) 962 bytes (B) 2048 bytes

(C) 1024 bytes (D) 1086 bytes

77. A high resolution B/w TV picture contains 3×10^6 picture elements and 16 different brightness levels. Pictures are repeated at a rate of 24 per second. All levels have equal likelihood of occurrence and all picture elements are assumed to be independent. What will be the average rate of information carried by this TV picture source ?

(A) 288 Mbps (B) 24 Mbps

(C) 132 Mbps (D) 3 Mbps

78. Which of the following sorting algorithms has the lowest worst-case complexity ?

(A) Merge sort (B) Bubble sort

(C) Quick sort (D) Insertion sort

79. A protected variable which can be accessed and changed by particular set of operation is called :

(A) interrupt (B) monitor

(C) semaphore (D) IPC

80. The following grammer is an example of _____.

$A \rightarrow a\ A\ B\ C$

$CB \rightarrow B\ c$

$A \rightarrow a\ b\ c$

$b\ B \rightarrow b\ b$

$B \rightarrow c\ b\ a$

(A) Type 0 Grammer

(B) Type 1 Grammer

(C) Type 2 Grammer

(D) Type 3 Grammer

81. The two numbers represented in Signed 2's complement form are

A = 11101101 and B = 11100110. If B is subtracted from A, the value obtained in signed 2's complement is :

(A) 111000101 (B) 00000111

(C) 11111000 (D) 10000011

82. The equivalent relational algebra expression for the query "Find the names of suppliers who supplied all the items to all the customers".

(A) $\neg\ t/t \in$ supplier (Q(t))

(B) $\forall\ t$ [Sname] / $t \in$ supplier (Q(t))

(C) $t/\neg\ t \in$ supplier (Q(t))

(D) $\forall\ t$ / (~Q(t))

83. The number of un-labeled non-isomorphic graphs with four vertices is :

(A) 12 (B) 11

(C) 10 (D) 9

84. TCP/IP model does not have _____ layer but OSI model have this layer.

(A) session layer

(B) transport layer

(C) application layer

(D) network layer

85. The bit transmission rate in a pulse coded modulation system with number of quantization levels 8 and maximum signal frequency 4000 Hz is given by :

(A) 16 kbps (B) 24 kbps

(C) 32 kbps (D) 8 kbps

86. The bit rate of digital communication system is R kbit/s. The modulation used is 32-QAM. The minimum bandwidth required for ISI free transmission is :

(A) R/10 Hz (B) R/10 kHz

(C) R/5 Hz (D) R/5 kHz

87. Convert $(503201)_6$ into $(?)_4$

(A) 12122231 (B) 11000011

(C) 21222301 (D) 22323301

88. Each layer of the OSI model receives services or data from a _____ layer.

(A) below layer

(B) above layer

(C) both (A) and (B)

(D) None of the above

89. Who developed standards for the OSI reference model ?

(A) ANSI - American National Standards Institute

(B) ISO - International Standards Organization

(C) IEEE - Institute of Electrical and Electronics Engineering

(D) ACM - Association for Computing Machinery

90. A binary tree of depth K is called a full binary tree of depth K, if it has exactly _____ nodes.

(A) K (B) 2^k

(C) $2^k - 1$ (D) $2^k + 1$

91. Following are implicitly provided in C programming language :

(A) Output facility

(B) Input facility

(C) Both Input and Output facility

(D) No input and Output facility

92. Which address is used to identify a process on a host by the transport layer ?

(A) physical address

(B) logical address

(C) port address

(D) specific address

93. The spectral efficiency of QPSK null to null having a width 4 Hz will be :

(A) ½ (B) 1

(C) ¼ (D) 4

94. The complement of the expression $Y = ABC + AB\overline{C} + \overline{A}\,\overline{B}\,C + \overline{A}BC$ is :

(A) $(\overline{A} + \overline{B})\ (A + \overline{C})$

(B) $(\overline{A} + B)(A + C)$

(C) $(A + \overline{B})\ (\overline{A} + C)$

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

95. If $z = \cos\left(\frac{x}{y}\right) + \sin\left(\frac{x}{y}\right)$, then $xz_x + yz_y$ is equal to _____.

(A) z (B) $2z$

(C) $4z$ (D) 0

96. For which one of the following sequences CAN NOT be a degree sequence of a graph of order 5 ?

(A) 3, 3, 2, 2, 2 (B) 3, 3, 3, 3, 2

(C) 3, 3, 3, 2, 2 (D) 4, 3, 3, 2, 2

97. If integer means to 2 bytes of storage then maximum value of a signed integer is :

(A) $2^{16} - 1$ (B) $2^{15} - 1$

(C) 2^{16} (D) 2^{15}

98. Which is the layer that converts Packets to Frames and Frames to Packets in the OSI model ?

(A) Physical Layer

(B) Data Link Layer

(C) Network Layer

(D) Transport Layer

99. Two Important lexical categories are _____.

(A) White Space

(B) Comments

(C) White Space & Comments

(D) None of the options

100. Delivery of the software product on time is considered as _____.

(A) SDLC

(B) User Satisfaction

(C) Planning

(D) UI/UX design for software

101. Which of the following Boolean expressions is not logically equivalent to all of the rest ?

(A) ab + (cd)′ + cd + bd′

(B) a (b + c) + cd

(C) ab + ac + (cd)′

(D) bd′ + c′d′ + ab + cd

102. On changing to spherical co-ordinates, the integral $\iiint_V dy\,dxdz$, where V is the volume of the hemisphere $x^2 + y^2 + z^2 = a^2$, is equivalent to the integral _____.

(A) $\int_0^{2\pi}\int_0^{\frac{\pi}{2}}\int_0^a r^2\,sin\theta\,drd\theta\,d\phi$

(B) $\int_0^{2\pi}\int_0^{\pi}\int_0^a r^2\,sin\theta\,drd\theta\,d\phi$

(C) $\int_0^{\frac{\pi}{2}}\int_0^{\frac{\pi}{2}}\int_0^a r^2\,sin\theta\,drd\theta\,d\phi$

(D) $\int_0^{2\pi}\int_0^{\frac{\pi}{2}}\int_0^a r^2\,cos\theta\,drd\theta\,d\phi$

103. For a hamming code of parity bit m = 5, what is the total bits and data bits ?

(A) (255, 247) (B) (127, 119)

(C) (31, 26) (D) (0, 8)

104. What is the access point (AP) in a wireless LAN ?

(A) device that allows wireless devices to connect to a wired network

(B) wireless devices itself

(C) both device that allows wireless devices to connect to a wired network and wireless devices itself

(D) all the nodes in the network

105. A sequence of statement of the form $x = y$ op z is called a :

(A) Three address code

(B) Syntax tree

(C) Postfix notation

(D) Operator

106. One root of $x^3 - x - 4 = 0$ lies in (1, 2). In bisection method, after first iteration the root lies in the interval _____.

(A) (1, 1.5)

(B) (1.5, 2)

(C) (1.25, 1.75)

(D) (1.75, 2)

107. If all transactions obey the _____, then all possible interleaved schedules (non - serial schedules) are serializable.

(A) Lock based protocol

(B) Two phase Locking protocol

(C) Read - write lock based protocol

(D) Time stamp based protocol

108. What will be the result of following relational algebra expression ?

$\pi_{A, B}(\sigma_{C=10}(R))$

(A) Print columns A & B from relation R when C = 10

(B) Print C = 10 from relation R

(C) Print all data of relation R when C = 10

(D) Print A, B, C from relation B when C = 10

109. What does the following code do ?

```
int a, b;
a = a + b;
b = a - b;
a = a - b;
```

(A) leaves a and b unchanged

(B) a doubles and stores in a

(C) b doubles and stores in a

(D) Exchanges a and b

110. In _____, machine is executing operating system instruction :

(A) System mode (B) User mode

(C) Normal mode (D) Safe mode

111. If the Value of Register A = 9B h & Carry = 1. What will be the value of Register A after executing the RORC instruction 1 time ?

(A) AB h (B) CD h

(C) EF h (D) AC h

112. $(a+b)^2$ corresponds to the language :

(A) $\{a+b, a+b\}$

(B) {aa, ab, ba, bb}

(C) {abab, baba}

(D) $\{a+b, (a+b)^2\}$

113. When a cache is 10 times faster than main memory, and the cache can be used 70% of the time, how much speed can be gained using cache ?

(A) $\simeq 10$ (B) $\simeq 0.3$

(C) $\simeq 0.7$ (D) $\simeq 2.7$

114. If data stored in AC = 5F h and DR = C2 h what is value of AC after AC^DR operation ?

(A) 9D (B) 42

(C) DF (D) DE

115. If A and B are two sets. A binary relation from set A and set B is any subset of the _____.

(A) Cartesian Product $A \times B$

(B) Union $A \cup B$

(C) Intersection $A \cap B$

(D) Addition $A + B$

116. Which notation gives the lower bound of a function ?

(A) $\ominus$ - notation

(B) $\bigcirc$ - notation

(C) Ω - notation

(D) None of the these

117. A variable p is said to be *live* at point m if and only if :

(A) p is assigned at point m

(B) p is not assigned at point m

(C) Value of p at m would be used along some path in the flow graph starting at point m

(D) Value of p at m would be used along some path in the flow graph ending at point m

118. Number of entity types participating in E-R diagrams is represented by :

(A) Degree of relationship

(B) Structure of relationship

(C) Instance of relationship

(D) Role of relationship

119. Integration testing, Unit Testing & System Testing are _____ .

(A) Fundamental logic of Testing

(B) Level Testing

(C) Core Testing

(D) Testing Suites

120. Let B_n denote the number of full binary trees with n vertices. Then a recurrence relation for B_n is :

(A) $B_n = B_{n-1} + O(1)$

(B) $B_n = 2B_{n-1} + O(1)$

(C) $B_n = B_{n-1} + O(n)$

(D) $B_n = 2B_{n-1} + O(n)$

- o 0 o -

SPACE FOR ROUGH WORK