Computer Programmer in Planning, Investment Promotion & Sustainable Development Department

Year of Advt: 2025 **Date of Exam: 11-September-2025**

Booklet Serial No. 40321

DO NOT BREAK THE SEAL OF THE BOOKLET UNTIL YOU ARE TOLD TO DO SO

SERIES : I

QUESTION BOOKLET

Subjects : General English, General Knowledge & Aptitude and Computer Science

Full Marks : 350 **Time Allowed : 2½ Hours**

Read the following instructions carefully before you begin to answer the questions.

INSTRUCTIONS TO CANDIDATES

1. This Booklet contains **175 questions** to be answered in a separate OMR Answer Sheet using Black Ballpoint Pen in the following three Parts :

Part—A	**:**	**General English**	**:**	**25 questions**
Part—B	**:**	**General Knowledge & Aptitude**	**:**	**50 questions**
Part—C	**:**	**Computer Science**	**:**	**100 questions**

2. **All** questions are compulsory.
3. You will be supplied the Answer Sheet separately by the Invigilator. You must complete the details of particulars asked for.
4. Answer must be shown by completely blackening the corresponding circle in the Answer Sheet against the relevant question number by Black Ballpoint Pen. OMR Answer Sheet without marking Series shall not be evaluated.

   Example :

   Suppose the following question is asked :

   The Capital of Meghalaya is

   (A) Guwahati

   (B) Kohima

   (C) Shillong

   (D) Delhi

   You will have four alternatives in the Answer Sheet for your response corresponding to each question of the Question Booklet as below :

   Ⓐ Ⓑ Ⓒ Ⓓ

   In the above illustration, if your chosen response is alternative (C), i.e., Shillong, then the same should be marked on the Answer Sheet by blackening the relevant circle with a Black Ballpoint Pen only as below :

   Ⓐ Ⓑ ● Ⓓ

   The example shown above is the only correct method of answering.
5. Answer the questions as quickly and as carefully as you can. Some questions may be difficult and others easy. Do not spend too much time on any one question.
6. There will NOT be any negative marking for wrong answers.
7. The Answer Sheet must be handed over to the Invigilator before you leave the Examination Hall.
8. No Rough Work is to be done on the Answer Sheet. Space for Rough Work has been provided in the Question Booklet.

SEAL

PART—A : GENERAL ENGLISH

(*Marks* : 50)

Each question carries **2** marks

Directions :

Read the passage carefully and answer the questions that follow.

Most of us use the products of science—railways, aeroplanes, electricity, wireless and thousands of others—without thinking how they came into existence. We take them for granted, as if we were entitled to them as a matter of right. And we are very proud of the fact that we live in an advanced age and are ourselves so very 'advanced'. Now, there is no doubt that our age is a very different one from previous ages and I think it is perfectly correct to say that it is far more advanced. But that is a different thing from saying that we as individuals or groups are more advanced. It would be the height of absurdity to say that because an engine-driver can run an engine and Plato or Socrates could not, the engine-driver is more advanced than, or is superior to Plato or Socrates. But it would be perfectly correct to say that the engine itself is a more advanced method of locomotion than Plato's chariot was.

1. Which one of the following statements is true?

(A) An engine-driver is cleverer than Plato or Socrates.

(B) Plato or Socrates is in no way inferior to the engine-driver.

(C) Plato and Socrates surpassed the engine-driver in every respect.

(D) The engine-driver cannot be compared to Plato or Aristotle.

2. In this passage the author mentions Plato and/or Socrates to emphasize that

(A) they are/were men of great scholarship

(B) people as individuals in the modern age are not more advanced than their predecessors

(C) the engine is a better mode of locomotion than Plato's chariot

(D) Plato and Aristotle had greater respect for learning

3. According to the author, the present age is far more advanced than

(A) all the previous ages in some respect

(B) the age of Socrates and Plato in some respects

(C) some of the previous ages in all respects

(D) all the previous ages in all respects

4. Many of us make use of machines

(A) with very little knowledge of their mechanism

(B) without any knowledge of how they came into existence

(C) with full knowledge of their genres

(D) without knowing how they were invented

5. People today are very proud because they live

(A) in a philosophically advanced age

(B) in a materially advanced age

(C) in a scientifically advanced age

(D) in a spiritually advanced age

***Directions* :**
Choose the correct option to fill in the gaps.

6. The robbers _____ the travellers.
(A) stole
(B) snatched
(C) looted
(D) attack

7. They found him guilty _____ murder.
(A) in
(B) from
(C) with
(D) of

8. It is they who _____ to blame.
(A) are
(B) is
(C) was
(D) were not

9. Hang _____ that rope and do not let go.
(A) down
(B) up
(C) onto
(D) to

10. He _____ in smoking.
(A) impresses
(B) indulges
(C) imposes
(D) expresses

11. Look this word _____ in the dictionary.
(A) over
(B) through
(C) down
(D) up

12. The food is _____.
(A) sufficient
(B) few
(C) many
(D) lot

13. I shall back _____ my friend's claim.
(A) out
(B) in
(C) up
(D) against

14. She _____ up the orphan as her own child.
(A) carried
(B) cared
(C) brought
(D) took

15. He always ran _____ wealth.
(A) after
(B) to
(C) with
(D) beside

***Directions* :**
Choose the correct meaning for the words and phrases given below.

16. To use up means
(A) resume
(B) costume
(C) consume
(D) presume

17. The act or ceremony of crowning a king means
(A) celebration
(B) felicitation
(C) compunction
(D) coronation

18. To consist of or be composed of means

(A) compress

(B) comprise

(C) conspire

(D) crystallize

19. To oppose boldly means

(A) defy

(B) deify

(C) deny

(D) decry

20. To think carefully and slowly means

(A) denigrate

(B) enumerate

(C) considerate

(D) deliberate

***Directions* :**

Choose the correct sentences.

21. (i) Tomorrow I promise and meet you.

(ii) I promise that I shall meet you tomorrow.

(iii) I promise to meet you tomorrow.

(A) (i) and (ii)

(B) (i) and (iii)

(C) (ii) and (iii)

(D) (i), (ii) and (iii)

22. (i) He went to the bank to withdraw money to buy a mobile phone.

(ii) He spent the mobile phone and drew money to the bank.

(iii) He spent the money on buying a mobile phone.

(A) (i) and (ii)

(B) (i) and (iii)

(C) (ii) and (iii)

(D) (i), (ii) and (iii)

23. (i) Since he is ill, he cannot attend college.

(ii) He is so ill that he cannot attend college.

(iii) On account of his illness, he cannot attend college.

(A) (i) and (ii)

(B) (i) and (iii)

(C) (ii) and (iii)

(D) (i), (ii) and (iii)

24. (i) In the exam, the boy confessed to be copying.

(ii) The boy said, "I have copied in the exam."

(iii) The boy confessed that he had copied in the exam.

(A) (i) and (ii)

(B) (i) and (iii)

(C) (ii) and (iii)

(D) (i), (ii) and (iii)

25. (i) She realized what a bore he was.

(ii) The bore was realized by her.

(iii) She realized that he was a big bore.

(A) (i) and (ii)

(B) (i) and (iii)

(C) (ii) and (iii)

(D) (i), (ii) and (iii)

PART—B : GENERAL KNOWLEDGE & APTITUDE

(*Marks* : 100)

Each question carries **2** marks

26. Who authored the book, *Hind Swaraj or Indian Home Rule*?

(A) Mahatma Gandhi

(B) Dr. B. R. Ambedkar

(C) Jawaharlal Nehru

(D) Rajendra Prasad

27. Which former Japanese Prime Minister was assassinated on 8th July, 2022?

(A) Yoshihide Suga

(B) Naoto Kan

(C) Yoshihiko Noda

(D) Shinzo Abe

28. Which NASA Telescope has delivered the deepest and sharpest infrared image of the distant universe capturing galaxy cluster SMACS 0723?

(A) Hubble Space Telescope

(B) James Webb Space Telescope

(C) Keck I

(D) Keck II

29. What is the height of Mount Everest as of 2020?

(A) 8749 m

(B) 8570 m

(C) 8849 m

(D) 8400 m

30. What is the chemical name of bleaching powder?

(A) Sodium chloride

(B) Calcium carbonate

(C) Sodium bicarbonate

(D) Calcium hypochlorite

31. Who is India's first individual Olympic Gold Medalist?

(A) Neeraj Chopra

(B) Vasudevan Baskaran

(C) Abhinav Bindra

(D) Richard Allen

32. Who is the 11th President of India?

(A) Draupadi Murmu

(B) A. P. J. Abdul Kalam

(C) Pratibha Patil

(D) Pranab Mukherjee

33. Which of the following is provided under Article 19 of the Indian Constitution?

(A) Freedom of speech and expression

(B) Protection of life

(C) Right to education

(D) None of the above

34. The Meghalayan Age is part of which geological period (epoch)?

(A) Eocene

(B) Oligocene

(C) Holocene

(D) Miocene

35. Which English Premier League football club has won the most Champions League Titles?

(A) Liverpool FC

(B) Chelsea FC

(C) Manchester United FC

(D) Arsenal FC

36. Who was the first female Deputy Commissioner of East Khasi Hills district, Meghalaya?

(A) Rebecca V. Suchiang

(B) Margaret R. Mawlong

(C) Rosemary Bathew

(D) Isawanda Laloo

37. The H1N1 virus strain causes which disease?

(A) COVID-19

(B) Monkeypox

(C) Swine Flu

(D) Ebola

38. Which of the following is the most recently declared wildlife sanctuary in the State of Meghalaya?

(A) Nongkhyllem Wildlife Sanctuary

(B) Narpuh Wildlife Sanctuary

(C) Siju Wildlife Sanctuary

(D) Baghmara Pitcher Plant Wildlife Sanctuary

39. Prayagraj is a renamed version of which Indian city?

(A) Patna

(B) Bhubaneswar

(C) Hyderabad

(D) Allahabad

40. What does the idiom, 'A dime a dozen' mean?

(A) Something rare

(B) Something common

(C) Something glittery

(D) Something expensive

41. In what order does the velocity of sound increase in the following media?

(A) Iron, water and air

(B) Air, water and iron

(C) Water, iron and air

(D) Iron, air and water

42. What is the full form of RUSA with respect to Indian education?

(A) Rashtriya Uchchatar Sena Abhiyan

(B) Rashtriya Uchchatar Samaj Abhiyan

(C) Rashtriya Uchchatar Shiksha Abhiyan

(D) None of the above

43. Which rank did North-Eastern Hill University secure under the NIRF, 2022 University ranking?

(A) 16

(B) 75

(C) 54

(D) 66

44. Which of the following tribes is proto-Australoid?

(A) Santhal

(B) Khasi

(C) Garo

(D) Munda

45. Who was appointed as the RBI Governor of India on 12th December, 2018?

(A) Dr. Urjit Patel

(B) Shri Shaktikanta Das

(C) Dr. Y. V. Reddy

(D) Dr. Raghuram Rajan

46. Which of the following is ***not*** a type of Secondary memory?

(A) Random Access Memory

(B) Solid State Drive

(C) Hard Disk Drive

(D) Removable USB Drives

47. Which of the following is ***not*** a crypto-currency?

(A) Bitcoin

(B) Shiba inu

(C) Fast cash

(D) Dogecoin

48. Which State in India is the largest producer of Eri and Muga Silk?

(A) Assam

(B) West Bengal

(C) Meghalaya

(D) Kerala

49. Choose the most appropriate antonym of the word 'diligent' from the following :

(A) Conscientious

(B) Active

(C) Meticulous

(D) Lazy

50. According to the World Health Organization, sound is considered as noise above which decibel?

(A) 75 dB

(B) 120 dB

(C) 65 dB

(D) 50 dB

51. A train covers a certain distance at the speed of 100 km/hr in 10 hours. At what speed will the train have to travel to cover the same distance in 5 hours?

(A) 120 km/hr

(B) 200 km/hr

(C) 150 km/hr

(D) 90 km/hr

52. A train, 120 meters long is running with a speed of 60 km/hr. In what time will it pass a boy who is running at 6 km/hr in the direction opposite to that in which the train is going?

(A) 6·54 s

(B) 3·42 s

(C) 5·65 s

(D) 8·0 s

53. *A* and *B* can do a piece of work in 4 days, while *C* and *D* can do the same work in 12 days. In how many days will *A*, *B*, *C* and *D* do it together?

(A) 6 days

(B) 4 days

(C) 7 days

(D) 3 days

54. If 15 men, working 9 hours a day, can build a house in 16 days, in how many days will 18 men working 8 hours a day complete the same work?

(A) 7 (B) 15

(C) 10 (D) 14

55. Tom's age after 15 years will be 5 times his age 5 years back. What is the present age of Tom?

(A) 15 (B) 10

(C) 20 (D) 25

56. The sum of ages of 5 children born at the intervals of 3 years each is 50 years. What is the age of the youngest child?

(A) 5 (B) 8

(C) 4 (D) 9

57. Find the missing number from the series :

15, 31, 63, _____, 255

(A) 126 (B) 127

(C) 128 (D) 129

58. 7 is added to a certain number, the sum is multiplied by 5; the product is divided by 9 and 3 is subtracted from the quotient. The remainder left is 12. What is the number?

(A) 15 (B) 25

(C) 35 (D) 20

59. A sum of ₹ 312 was divided among 100 boys and girls in such a way that each boy gets ₹ 3·60 and each girl gets ₹ 2·40. How many girls are there?

(A) 40 (B) 60

(C) 50 (D) 30

60. The average weight of *A*, *B* and *C* is 45 kg. If the average weight of *A* and *B* is 40 kg and that of *B* and *C* is 43 kg, then what is the weight of *B*?

(A) 34 (B) 35

(C) 31 (D) 36

61. A number is doubled and 9 is added. If the resultant is trebled, it becomes 75. Find the number.

(A) 8 (B) 6

(C) 10 (D) 12

62. Three numbers are in the ratio 4 : 5 : 6 and their average is 25. What is the largest number?

(A) 35 (B) 30

(C) 45 (D) 40

63. In an election involving 2 candidates, 68 votes were declared invalid. The winning candidate secures 52% and wins by 98 votes. What is the total number of votes polled?

(A) 2518 (B) 2345

(C) 2670 (D) 2500

64. In an examination, there are three papers and a candidate has to get 35% of the total to pass. In one paper he secures 62 out of 150 and in the second 35 out of 150. How much must he get, out of 180 in the third paper to just qualify for a pass?

(A) 71 (B) 65

(C) 60 (D) 75

65. The percentage profit earned by selling article for ₹ 1,920 is equal to the percentage loss incurred by selling the same article for ₹ 1,280. At what price should the article be sold to make a 25% profit?

(A) 2300 (B) 2600

(C) 2200 (D) 2000

66. Joe bought an article and paid 10% less than the original price. He then sold the article for 30% profit on the price he had paid. What percentage of profit did he earn on the original price?

(A) 19% (B) 17%

(C) 20% (D) 15%

67. The salaries of A, B and C are in the ratio 2 : 3 : 5. If the increment of 15%, 10% and 20% are allowed respectively in their salaries, then what will the new ratio of their salaries be?

(A) 4 : 5 : 8

(B) 15 : 10 : 20

(C) 23 : 33 : 60

(D) 10 : 20 : 15

68. One pipe can fill a tank three times faster than another pipe. If together the two pipes can fill the tank in 36 minutes, then how long will the slower pipe be able to fill the tank on its own?

(A) 108 minutes (B) 114 minutes

(C) 184 minutes (D) 144 minutes

69. Thomas invested an amount of ₹ 13,900 in two different schemes. Scheme A at simple interest 14% p.a. and B at 11% p.a. If the total amount of simple interest earned in two years is ₹ 3,508, what was the amount invested in scheme B?

(A) ₹ 6,400 (B) ₹ 7,500

(C) ₹ 6,200 (D) ₹ 7,000

70. Find the compound interest on ₹ 10,000 in 2 years at 4% per annum, the interest being compounded half-yearly.

(A) ₹ 852·50 (B) ₹ 786·65

(C) ₹ 824·32 (D) ₹ 902·50

71. The area of a rectangle is 460 m^2. If the length is 15% more than the breadth, what is the breadth of the rectangular field?

(A) 15 m (B) 20 m

(C) 25 m (D) 30 m

72. A man in a moving train can count 21 telephone posts in 1 minute. If the posts are 50 meters apart, then what is the speed of the train?

(A) 50 km/hr

(B) 58 km/hr

(C) 60 km/hr

(D) 65 km/hr

73. A 70 cm long wire is to be cut into two pieces such that one piece will be 2/5 as long as the other. How many centimeters will the shorter piece be?

(A) 25

(B) 24

(C) 26

(D) 20

74. The age of a man is three times the sum of the ages of his two sons. Five years hence, his age will be double of the sum of the ages of his son. What is the father's present age?

(A) 40

(B) 45

(C) 48

(D) 50

75. A metallic sheet is of rectangular shape with dimensions 48 m × 36 m. From each of its corners, a square is cut off so as to make an open box. If the length of the square is 8 m, the volume of the box (in m^3) is

(A) 5120

(B) 5560

(C) 5420

(D) 5021

PART—C : COMPUTER SCIENCE

(*Marks* : 200)

Each question carries **2** marks

76. Which type of ROM can be electrically erased and reprogrammed?

(A) PROM

(B) EPROM

(C) EEPROM

(D) None of the above

77. The decimal equivalent of $(1010{\cdot}011)_2$ is

(A) $(10{\cdot}375)_{10}$

(B) $(10{\cdot}25)_{10}$

(C) $(12{\cdot}375)_{10}$

(D) $(12{\cdot}25)_{10}$

78. What is the sum of $(367)_8$ and $(715)_8$?

(A) $(1082)_8$

(B) $(1304)_8$

(C) $(1204)_8$

(D) $(1308)_8$

79. The simplified Boolean function of $x'y'z + x'yz + xy'$ is

(A) $x'y' + xy'$

(B) $x'y + yz$

(C) $x'z + xy$

(D) $x'z + xy'$

80. Given a function $F = y' + x'z'$ and don't care condition $d = yz + xy$, the simplified function is

(A) $y' + x'z'$

(B) $y' + x'$

(C) 1

(D) y'

81. In a clocked R-S flip-flop, if the previous state $Q = 1$, and the inputs are $S = 0$ and $R = 1$, then the next state $Q(t+1)$ of the flip-flop is

(A) 0 (reset)

(B) 1 (set)

(C) indeterminate

(D) None of the above

82. The combinational circuit that converts binary information from n input lines to 2^n output lines is known as

(A) encoder

(B) decoder

(C) multiplexer

(D) demultiplexer

83. A group of flip-flops is known as

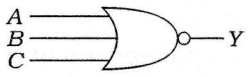
(A) counter

(B) multiplexer

(C) master-slave flip-flop

(D) register

84. The Boolean expression corresponding to the logic gate



is

(A) $Y = \overline{ABC}$

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

(C) $Y = ABC$

(D) $Y = A + B + C$

85. The 2's complement of binary number $(0011)_2$ is

(A) 1101 (B) 1100

(C) 1111 (D) 0100

86. If the digital rate of 9600 bps is encoded using 8-level phase shift keying (PSK) method, the modulation is

(A) 1400 baud

(B) 4800 baud

(C) 3200 baud

(D) 4200 baud

87. An image is 1600×1200 pixels with 3 bytes/pixel. Assume the image is uncompressed. How long does it take to transmit it over a 1-Mbps cable modem?

(A) 46 seconds

(B) 46·08 seconds

(C) 32 seconds

(D) 48 seconds

88. The data link layer uses byte stuffing to transmit the byte sequence "A FLAG B".

What is the string actually transmitted after byte stuffing?

(A) FLAG A FLAG B FLAG

(B) A FLAG FLAG B

(C) ESC A FLAG B ESC

(D) FLAG A ESC FLAG B FLAG

89. The IP range 192.168.X.X is a commonly and widely used IP address range for use within

(A) home and small business networks

(B) public networks

(C) Both (A) and (B)

(D) None of the above

90. A congestion control technique that discards packets when congestion occurs is

(A) load shedding

(B) traffic throttling

(C) admission control

(D) network provisioning

91. An IP address 129.1.100.215 belongs to which class?

(A) Class A

(B) Class B

(C) Class C

(D) Class D

92. If one of the addresses in a given block is 205.16.37.39/28, what are the first and last addresses in this block?

(A) 205.16.37.0 and 205.16.37.39

(B) 205.16.37.1 and 205.16.37.39

(C) 205.16.37.30 and 205.16.37.57

(D) 205.16.37.32 and 205.16.37.47

93. The source to destination delivery of packet is provided by

(A) network layer

(B) application layer

(C) transport layer

(D) data link layer

94. In wireless networks, which of the following best explains the Hidden Station Problem?

(A) A station cannot detect a collision at the receiver end

(B) Two stations that are out of range of each other transmit simultaneously, causing a collision at a common receiver

(C) A station unnecessarily defers transmission because it senses the medium is busy due to a nearby transmission, although the intended receiver could receive the signal without interference

(D) A station can sense the medium but cannot decode the data correctly due to signal fading

95. A Bluetooth LAN formed between nearby devices is commonly called a

(A) Piconet

(B) Bluetooth_net

(C) Scatternet

(D) Micronet

96. Which of the following scanf() statements is correct?

(A) scanf("%f", float-variable);

(B) scanf("%d, &int-variable");

(C) scanf("%f", &int-variable);

(D) scanf("%d", &int-variable);

97. Which of the following is ***not*** a storage class specification in C?

(A) Automatic

(B) Register

(C) Integer

(D) Static

98. What would be the output of the following program?

```
int main( ) {
    int n1=2, n2=3, s;
    s = 2 + – – n1 + n2 + + ;
    printf("%d", s);
    return 0;
}
```

(A) 6 (B) 7

(C) 5 (D) 8

99. Consider the following program :

```
int main( ) {
    int n[ ]={2, 3, 5};
    printf("%d", [1]n+n[2]);
    return 0;
}
```

(A) The output is 8

(B) The output is 5

(C) Compilation error

(D) The output is 7

100. Which of the following statements is used to transfer control to the beginning of a loop in C?

(A) Exit

(B) Break

(C) Continue

(D) None of the above

101. What will be the output of the following C program?

```
int main( ) {
    int n=1, s=0;
    while(n<=10){
    s + + ;
    n + = s % 2 = = 0 ? 2 : 1;
    }
    printf("%d", s);
    return 0;
}
```

(A) 6 (B) 7

(C) 10 (D) 8

102. Which of the following statements is ***not true*** regarding pointers in C?

(A) A pointer variable can be assigned the address of an ordinary variable.

(B) A pointer variable cannot be assigned a NULL value.

(C) A pointer variable can be assigned the value of another pointer variable.

(D) One pointer variable can be subtracted from another provided both pointers point to elements of the same array.

103. All macro substitutions in a C program are performed

(A) before compilation of the program

(B) after compilation

(C) during execution

(D) None of the above

104. Consider the following variable declarations :

```
char ch;
short s;
long int li;
float f;
```

What is the overall type of the expression `f/ch-(s*li)`?

(A) char

(B) long int

(C) short

(D) float

105. In a C program, if an error occurs while opening a file using fopen(), the file pointer is assigned a value

(A) NULL

(B) stdout

(C) stderr

(D) −1

106. Which of the following best describes a composite attribute in database design?

(A) An attribute that can hold multiple values simultaneously

(B) An attribute that cannot be divided further

(C) An attribute that can be divided into smaller subparts

(D) An attribute used as a primary key

107. The data dictionary tells the DBMS

(A) what files are in the database

(B) what attributes are processed by the data

(C) what these files contain

(D) All of the above

108. The SELECT operation in relational algebra will create a new relation that has

(A) the same number of rows as the original relation

(B) fewer rows than the original relation

(C) Either (A) or (B)

(D) Both (A) and (B)

109. Consider a disk with the following characteristics :

Block size (B) = 512 bytes
Interblock gap size (G) = 128 bytes
Number of blocks per track = 20
Number of tracks per surface = 400

What is the total capacity and the useful capacity of a single track?

(A) Total : 10240 bytes;
Useful : 12800 bytes

(B) Total : 12800 bytes;
Useful : 10240 bytes

(C) Total : 6400 bytes;
Useful : 5120 bytes

(D) Total : 20480 bytes;
Useful : 16384 bytes

110. Which of the following statements about superkeys and keys in relational database is true?

(A) Every relation has at least one default superkey—the set of all its attributes.

(B) Any set of attributes that includes a key is a superkey.

(C) A minimal superkey is also a key.

(D) All of the above

111. Consider a relation $R(A, B, C, D, E, F)$ with a given sets of functional dependencies $F = \{B \rightarrow C,\ BC \rightarrow AD,\ D \rightarrow E,\ CF \rightarrow B\}$. Find the closure of B or B^+.

(A) $B^+ = \{ABCDE\}$

(B) $B^+ = \{ABCDEF\}$

(C) $B^+ = \{ABCD\}$

(D) $B^+ = \{ABCEF\}$

112. Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I\}$ and the set of functional dependencies $G = \{AB \rightarrow C,\ BD \rightarrow EF,\ AD \rightarrow GH,\ A \rightarrow I,\ H \rightarrow J\}$. What is the key for R?

(A) ABC

(B) AB

(C) ADE

(D) ABD

113. Which of the following statements correctly distinguishes 2NF, 3NF and BCNF?

(A) 2NF removes partial dependencies; 3NF removes transitive dependencies; BCNF removes all functional dependencies.

(B) 2NF ensures atomic attributes; 3NF allows transitive dependencies; BCNF allows partial dependencies.

(C) 2NF removes partial dependencies; 3NF removes transitive dependencies; BCNF ensures every determinant is a candidate key.

(D) 2NF, 3NF and BCNF all eliminate transitive and partial dependencies without exceptions.

114. An attribute in one table that refers to the primary key of another table is known as a

(A) foreign key

(B) secondary key

(C) candidate key

(D) composite key

115. What will be the result of the following SQL query?

```
select * from employee where fname
like '__m%';
```

(A) Retrieve all employees whose first name starts with two characters followed by 'm'

(B) Retrieve all employees whose third letter of the first name is 'm'

(C) Retrieve all employees whose first name ends with 'm'

(D) Retrieve all employees whose first name starts with two blank spaces followed by 'm'

116. In C++ programming, a friend function has access to

(A) public member

(B) private member

(C) protected member

(D) any of the above

117. Which constructor in C++ programming creates a new object from an existing one by initialization?

(A) Copy constructor

(B) Default constructor

(C) Parameterized constructor

(D) Dynamic constructor

118. Which operator is used to access members of a class in C++?

(A) . (dot) operator

(B) → (arrow) operator

(C) Either (A) or (B)

(D) None of the above

119. Which of the following statements about enumerated data types in C++ is correct?

(A) Enum members must be unique across the entire program.

(B) Enum values cannot be assigned manually.

(C) Enum values start from 1 by default.

(D) An enum defines a set of integer constants.

120. In C++ programming, multiple inheritance refers to

(A) one base class and one derived class

(B) one base class and multiple derived classes

(C) one derived class inheriting from multiple base classes

(D) multiple base classes and multiple derived classes

121. If the characters *D*, *C*, *B*, *A* are placed in a queue (in that order), and then removed one at a time, in what order will they be removed?

(A) *ABCD*

(B) *ABDC*

(C) *DCAB*

(D) *DCBA*

122. Which of the following statements is true about a doubly linked list?

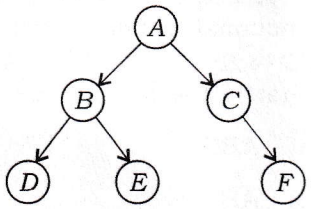
(A) A doubly linked list is a linear data structure.

(B) Each node contains pointers to both the previous and next nodes.

(C) Traversal can be done from left to right and right to left.

(D) All of the above

123. What will be the DFS (Depth-First Search) traversal order for the following graph?



(A) *ABCDEF*

(B) *FEDCBA*

(C) *ABDECF*

(D) *ACFBDE*

124. The minimum number of edges in a connected cyclic graph on n vertices is

(A) $n-1$

(B) n

(C) $n+1$

(D) $n+2$

125. What is the Reverse Polish Notation (postfix form) of the expression $A*B+C/D$?

(A) $AB*+CD/$

(B) $AB*CD/+$

(C) $A*B+/CD$

(D) $ABCD*+/$

126. Which of the following algorithm design techniques is used in the quicksort algorithm?

(A) Dynamic programming

(B) Backtracking

(C) Greedy method

(D) Divide and conquer

127. The number of edges in a regular graph of degree d and n vertices is

(A) maximum of n, d

(B) $n + d$

(C) nd

(D) $nd/2$

128. If the following sequence of operations is performed on a stack

push(1), push(2), pop, push(1), push(2), pop, pop, pop, push(2), pop

what will be the sequence of values popped from the stack?

(A) 2, 2, 1, 1, 2

(B) 2, 2, 2, 2, 2

(C) 2, 1, 2, 2, 1

(D) 1, 1, 2, 2, 2

129. Each node in a linked list must contain at least

(A) three fields

(B) two fields

(C) one field

(D) four fields

130. Which of the following statements is true about a binary search tree (BST)?

(A) An inorder traversal of a BST always yields nodes in descending order.

(B) In a BST, the left child of a node contains only nodes with keys less than the node's key.

(C) A BST cannot have duplicate values.

(D) The height of a BST with n nodes is always $\log_2(n)$.

131. Which of the following Linux command can be used to get information about yourself?

(A) pwd

(B) whoami

(C) which

(D) hostname

132. Which Linux command is used to display all files in a directory, including hidden files?

(A) ls –1

(B) ls –F

(C) ls –x

(D) ls –a

133. What does the permission 755 indicate for a file or directory in Linux?

(A) Read and write permission for the owner, and no permissions for group and others

(B) Full permissions for everyone

(C) Read, write and execute permission for the owner; read and execute permission for group and others

(D) Read and write permission for the owner; read-only permission for group and others

134. Page fault occurs when

(A) the page is corrupted by application software

(B) the page is in main memory

(C) the page is not in main memory

(D) one tries to divide a number by 0

135. Given the page reference string 1, 2, 4, 5, 2, 1, 2, 4, determine the number of page faults using the Least Recently Used (LRU) page replacement algorithm.

Assume the main memory can hold 3 pages, and initially contains pages 1 and 2, with page 1 loaded before page 2.

(A) 3 (B) 5

(C) 4 (D) 2

136. An operating system contains 3 user processes each requiring 2 units of resource *R*. The minimum number of units of *R* such that no deadlock will ever occur is

(A) 4 (B) 3

(C) 5 (D) 6

137. Which of the following is the most suitable scheduling scheme in a real-time operating system?

(A) Round-robin

(B) First-come-first-served

(C) Random scheduling

(D) Pre-emptive scheduling

138. Which of the following is single-user operating system?

(A) MS-DOS

(B) XENIX

(C) UNIX

(D) OS/2

139. Consider a set of 5 processes whose arrival time, CPU time needed and the priority (where a smaller number indicates higher priority) are given below :

Process	*Arrival Time* (in ms)	*CPU Time Needed* (in ms)	*Priority*
*P*1	0	10	5
*P*2	0	5	2
*P*3	2	3	1
*P*4	5	20	4
*P*5	10	2	3

If the CPU scheduling policy is First-Come, First-Served (FCFS), the average waiting time will be

(A) 12·8 ms (B) 8 ms

(C) 16 ms (D) 10 ms

140. Consider the table from Question No. **139**. If the CPU scheduling policy is Shortest Job First (SJF) with pre-emption, what will be the average waiting time for these processes?

(A) 8 ms (B) 14 ms

(C) 5·6 ms (D) 4 ms

141. Which of the following is a characteristic of the Waterfall model in software development?

(A) Requirements can be changed after the development phase has started

(B) Testing is done only after the coding phase is completed

(C) The process is iterative, with continuous feedback at each phase

(D) All phases are executed simultaneously and in parallel

142. Spiral model begins with

(A) design

(B) risk analysis

(C) coding

(D) customer communication

143. Which of the following is a software project estimation technique?

(A) LOC based

(B) COCOMO

(C) Both (A) and (B)

(D) None of the above

144. The Data Flow Diagram (DFD) illustrates

(A) the flow of data

(B) the process

(C) the areas where data are stored

(D) All of the above

145. A program *P* calls two subprograms *P*1 and *P*2. *P*1 can fail 50% times and *P*2 can fail 40% times. The program *P* can fail

(A) 50%

(B) 60%

(C) 10%

(D) 70%

146. In SQL, which command is used to retrieve data in rows and column from one or more tables?

(A) CHOOSE

(B) SELECT

(C) LIST

(D) BROWSE

147. What are true for variable-length records in a database?

(i) Storage of multiple record types in a file.

(ii) Record types that allow variable lengths for one or more fields.

(iii) Record types that allow repeating fields.

(iv) It is difficult to delete a record from this structure. The space occupied by the record to be deleted must be filled with some other records of file.

Choose the correct answer from the codes given below.

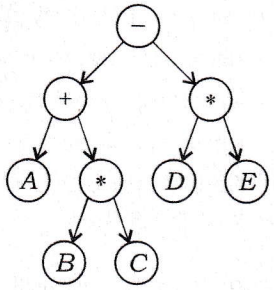
(A) (i) and (ii)

(B) (i) and (iv)

(C) (i), (ii), (iii)

(D) All of the above

148. Given the following expression tree, what is its postorder traversal?



(A) $A + * DC - * DE$

(B) $- + A * BC * DE$

(C) $ABC * + - DE *$

(D) $ABC * + DE * -$

149. Which of the following best describes the role of the control unit in a CPU?

(A) It performs arithmetic and logic operations

(B) It stores instructions and data

(C) It interprets instructions and directs data flow

(D) It connects the CPU to peripheral devices

150. In a memory hierarchy, which of the following is typically the fastest and most expensive per bit?

(A) Cache memory

(B) RAM

(C) Hard Disk

(D) Virtual memory

151. Which of the following addressing modes uses the contents of a register as the address of the operand?

(A) Immediate addressing

(B) Direct addressing

(C) Register addressing

(D) Register indirect addressing

152. What is the main advantage of using a pipeline in CPU design?

(A) Reduces memory usage

(B) Increases clock speed

(C) Improves instruction throughput

(D) Allows simultaneous execution of two programs

153. In microprogrammed control, the control signals are generated by

(A) hardware logic gates

(B) a compiler

(C) a control memory storing micro-instructions

(D) an operating system scheduler

154. What is the primary purpose of a data warehouse?

(A) To perform real-time transaction processing

(B) To store historical data for analysis and reporting

(C) To manage daily operational data updates

(D) To handle unstructured data for machine learning

155. In a data warehouse, what does the ETL process stand for?

(A) Extract, Transform, Load

(B) Evaluate, Test, Launch

(C) Extract, Translate, Link

(D) Execute, Transform, Load

156. In a data warehouse, what is the main purpose of a fact table?

(A) To store hierarchical relationships between dimensions

(B) To hold descriptive information about business entities

(C) To store quantitative data for analysis, usually linked to dimension tables

(D) To define the structure of dimensions

157. The primary purpose of the a priori algorithm in data mining is

(A) to classify data into predefined categories

(B) to identify frequent item sets for association rule mining

(C) to cluster similar data points into groups

(D) to predict continuous values using regression

158. In a decision tree classifier, what is the primary purpose of pruning the tree after it has been built?

(A) To increase the depth of the tree for better accuracy

(B) To reduce overfitting by removing branches that do not generalize well

(C) To ensure all leaf nodes have the same number of instances

(D) To convert the tree into a binary classification model

159. Which of the following algorithms is commonly used for classification tasks?

(A) K-means

(B) DBSCAN

(C) Decision tree

(D) A priori

160. The new operator in Java

(A) allocates memory for an object at runtime

(B) allocates memory for an object at compile time

(C) defines a new data type

(D) defines a new class

161. The purpose of using the final keyword in Java is

(A) to make variables immutable after initialization

(B) to prevent a class from being extended

(C) to restrict method overriding in subclasses

(D) All of the above

162. What will be the output of the following code?

```
public class Test {
  public static void main(String[] args) {
    try {
      int result = 10/0;
    } catch (ArithmeticException e) {
      System.out.println("Caught Arithmetic
      Exception");
    } catch (Exception e) {
      System.out.println("Caught
      Exception");
    }
  }
}
```

(A) Caught Exception

(B) Caught ArithmeticException

(C) Compilation Error

(D) Runtime Error

163. Which of the following approaches can be used to create a thread in Java?

(i) Implement the Runnable interface

(ii) Extend the thread class

Choose the correct answer from the codes given below.

(A) Only (i)

(B) Only (ii)

(C) Either (i) or (ii)

(D) Neither (i) nor (ii)

164. Given the following declaration :

String str = "Hello World";

What character will the statement str.charAt(4) return?

(A) o (B) l

(C) w (D) e

165. In the Delegation Event Model, which object is responsible for generating events?

(A) Event listener

(B) Event object

(C) Event handler

(D) Event source

166. Which of the following statements is true about checked exceptions?

(A) They can be ignored at compile time

(B) They must be handled using try-catch or declared using throws

(C) They occur due to programming errors like null pointers

(D) They inherit from RuntimeException

167. Which of the following methods is used to check whether a thread is still running?

(A) isAlive()

(B) isRunning()

(C) checkStatus()

(D) getState()

168. Which of the following functions in PHP returns the number of elements in an array?

(A) sizeoff()

(B) length()

(C) count()

(D) Either (A) or (C)

169. Which of the following methods acts as a constructor in PHP?

(A) _construct()

(B) constructor()

(C) init()

(D) _init()

170. Which PHP function is used to perform a regular expression match?

(A) preg_match()

(B) ereg()

(C) str_match()

(D) match()

171. Which regular expression will match a 6-digit pin code (e.g., "123456")?

(A) /[0-9]{6}/

(B) /^\d{6}$/

(C) /^\d{6}/

(D) /\d{6}$/

172. Which of the following correctly declares and initializes a jagged array with 2 rows in VB.NET, where the first row has 2 elements and the second row has 3 elements?

(A) Dim arr(1, 2) As Integer

(B) Dim arr(1)() As Integer
arr(0)=New Integer(){1,2}
arr(1)=New Integer() {3,4,5}

(C) Dim arr(1,2)() As Integer
arr(0)(0)=1

(D) Dim arr() As Integer={{1,2},{3,4,5}}

173. What is the purpose of the ByRef keyword in a function parameter?

(A) To create a copy of the variable

(B) To prevent modification of the variable

(C) To declare a constant parameter

(D) To pass the value by reference

174. What does the acronym MDI represent in the context of VB.NET Windows applications?

(A) Multiple document interface

(B) Multiple design interface

(C) Manipulated document interface

(D) Menu design interface

175. Where does a web service class typically reside in a .NET application?

(A) On the local client system

(B) On a web server

(C) In the project folder

(D) None of the above