

18/2015

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Which state of India has its secretariate in WRITERS BUILDING?
(A) West Bengal (B) Tamil Nadu
(C) Punjab (D) Bihar
2. "NOT JUST AN ACCOUNTANCY" is a service story written by :
(A) Dr. Manmohan Singh (B) Dr. Thomas Issac
(C) Vinod Rai (D) Dr. John Mathai
3. The well-known "Kuttankulam Satyagraha" was held in :
(A) Irinjalakuda (B) Punjab
(C) Vaikom (D) Punalur
4. "Guruvinde Dukham" written by :
(A) M.K. Sanu (B) Sukumar Azhicode
(C) Dr. Babu Paul (D) Ayyappa Panikkar
5. The Magazine "Yukti Vadi" founded by :
(A) E.M.S (B) Sahodaran Ayyappan
(C) K. Kelappan (D) A.K. Gopalan
6. The founder of Prathyaksha Raksha Daiva Sabha was :
(A) Vaikunda Swamikal (B) Ayyankali
(C) Poikayil Appachan (D) Mannath Padmanabhan
7. B.K.S Ayyangar recently passed away was a great expert of :
(A) Modern Medicine (B) Bharat Natyam
(C) Kathak (D) Yoga
8. KPAC is a drama troupe of :
(A) Kannur (B) Kozhikode
(C) Thrissur (D) Alapuzha

9. "Kanaleriyumkalam" is the autobiography of :
 (A) Kuthattukulam Mary (B) Rosama Punnose
 (C) Acama Cheriyan (D) K.R. Gouri
10. The brand ambassador of the "Clean Campus, Safe Campus" programme :
 (A) Mamotty (B) Mohan Lal
 (C) Fahad Fazil (D) Manju Warriar
11. When $0 < \theta < \frac{\pi}{2}$, the sum of the series
 $1 - \cos \theta + \cos^2 \theta - \cos^3 \theta + \dots + (-1)^n \cos^n \theta + \dots$ is :
 (A) $1 + \sin \theta$ (B) $\sqrt{2} \tan \theta$
 (C) $\frac{1}{2} \sec^2 \left(\frac{\theta}{2} \right)$ (D) $\frac{\sec \theta}{\sqrt{2}}$
12. The angle between the lines $x - y = 2$ and $x + y = 1$ is :
 (A) 0 (B) $\frac{\pi}{2}$
 (C) $\frac{\pi}{4}$ (D) π
13. Let A, B be two $n \times n$ orthogonal matrices then which of the following is true :
 (A) AB is orthogonal (B) AB is symmetric
 (C) AB is triangular (D) AB is singular
14. The greatest rectangular area that can be enclosed by a 20 meter fencing is :
 (A) 100 (B) 50
 (C) 200 (D) 25
15. The area bounded by the straight lines $x = 0$, $y = 0$ and $x + y = a$ is :
 (A) a^2 (B) $\frac{a}{2}$
 (C) $\frac{a^2}{2}$ (D) a

16. The solution of the system of linear equation $x + y = 0$, $2x + y + z = 1$, $y + z = -1$ is :

(A) 1, -2, 2

(B) 1, -1, 0

(C) 1, 2, -2

(D) 1, -1, 1

17. The value of $(\cos 15^\circ - \sin 15^\circ)^2$ is :

(A) $\frac{1}{2}$

(B) $\frac{\sqrt{3}}{2}$

(C) $\frac{1}{\sqrt{2}}$

(D) $\frac{-1}{2}$

18. The solution of the differential equation $(x + 2y^3) \frac{dy}{dx} = y$ is :

(A) $x^2 + \frac{y^2}{2} = c$

(B) $x = y^3 + cy$

(C) $\frac{x^2}{2y} + \frac{2y^3}{3} = x + c$

(D) $x = y^2(c - e^{-y})$

19. $\int x e^{-x^2} dx$ is :

(A) $(1 - x^2) e^{-x} = c$

(B) $x e^{-x} = x + c$

(C) $x e^{x^2} - e^{-x^2} = c$

(D) $-\frac{e^{-x^2}}{2} + c$

20. If A is 2×2 matrix with $|A| = 3$, then $|A(\text{adj } A)|$ is :

(A) 6

(B) 9

(C) 4

(D) 12

21. The ingredient of brick earth that gives red colour to bricks is :

(A) Alumina

(B) Iron oxide

(C) Magnesia

(D) Silica

22. The steel which is used in RCC is :

(A) Cast steel

(B) Stainless steel

(C) Mild steel

(D) Nickel steel

23. The most economical foundation used when heavy structural loads from columns are required to be transferred to a soil of low bearing capacity is :
- (A) Raft foundation (B) Stepped foundation
(C) Grillage foundation (D) Pile foundation
24. The basic principle of surveying is :
- (A) working from whole to the part (B) working from part to whole
(C) Both (A) and (B) (D) Reconnaissance
25. The back sight on a B.M. of RL 150.205 is 1.505 m. Calculate the H.I. of the instrument :
- (A) 150.755 (B) 150.205
(C) 148.700 (D) 151.710
26. The turning moment of a two-stroke cycle engine is more uniform than a four-stroke engine because :
- (A) Value operations are required in four-stroke engine, instead parts are used in two-stroke engine
(B) In two-stroke engine, there is one power stroke in every revolution of the crank shaft
(C) Both sides of the piston are effective during the operation of a two-stroke engine
(D) Fuel supply is more uniform in two-stroke engine compared to four-stroke engine
27. Higher compression ratio is employed in diesel engine compared to petrol engine because :
- (A) self ignition temperature of diesel fuel is higher than petrol
(B) specific gravity of diesel fuel is higher than petrol
(C) hot compressed air is required to ignite the fuel injected in diesel engine
(D) residual gases can be reduced at higher compression ratio
28. The function of propeller shaft in an automobile is :
- (A) to transmit power from gear box to the differential
(B) to transmit power from engine to the gear box
(C) to vary the power from minimum to maximum
(D) to actuate the steering gear mechanism

29. The function of a surge tank in a hydro-electric power plant is :
- (A) to control the level of water in the reservoir
 - (B) to increase the power output from the turbine
 - (C) to store excess water from the reservoir
 - (D) to control the pressure fluctuation in the penstock pipe
30. Control rod is used in nuclear power plant, in order to :
- (A) control the pressure of coolant
 - (B) control the flow rate of coolant
 - (C) control the nuclear chain reaction
 - (D) slow down the fast moving neutrons in the reactor
31. The condition with which the Ohm's law is valid when :
- (A) Voltage is directly proportional to current
 - (B) Voltage is inversely proportional to current
 - (C) Current is proportional to resistance
 - (D) Temperature remains constant
32. Lenz's law is used to determine the direction of :
- (A) Dynamically induced emf
 - (B) Statically induced emf
 - (C) Magnetic field
 - (D) Mutually induced emf
33. Two resistors of 10 ohm and 20 ohm are connected in parallel. If the current in 10 ohm resistor is 2 A what is the current in the other resistor?
- (A) 1 A
 - (B) 3 A
 - (C) 2 A
 - (D) 4 A
34. The main function of Earth Leakage Circuit Breaker (ELCB) is to protect the circuit against :
- (A) over-current
 - (B) under voltage
 - (C) lightning
 - (D) earth leakage current
35. The voltage across an RLC series ac circuit is 10 V. What will be the voltage across the capacitor (C) if the voltage across the resistance (R) is 8 V and the inductor (L) is 12V?
- (A) 8 V
 - (B) 18 V
 - (C) 5 V
 - (D) 12 V

36. The ripple factor of a full bridge rectifier without any filter connected to it is :
- (A) 1.11 (B) 0.482
(C) 1.00 (D) 1.21
37. An LED, 1 k ohm resistor and a 5 volt dc source is connected in series. Assume the voltage measured across the LED is 2 V. The current flow through the LED is :
- (A) 1mA (B) 10mA
(C) 2mA (D) 3mA
38. A microprocessor is classified into 8-bit microprocessor based on its :
- (A) Data bus width (B) Address bus width
(C) ALU width (D) Control bus width
39. The output voltage of a voltage source Pulse width modulated inverter depends on the following :
- (A) DC battery voltage alone
(B) DC battery voltage and modulation index
(C) Output frequency
(D) Modulation index alone
40. A Bipolar Junction Transistor is used to drive an SPDT relay. When the relay is energized, the transistor will be operating in _____ region.
- (A) Saturation region (B) Cut-off region
(C) Active region (D) Cut-off and saturation
41. Which of the following Access Control Methods is probabilistic?
- (A) Polling (B) Contention
(C) Token Passing (D) Sliding Window
42. One of the addresses in a block is 167.199.170.82/27. What is the last address in this block?
- (A) 167.199.170.95 (B) 167.199.170.96
(C) 167.199.170.255 (D) 167.199.170.224
43. A network layer firewall works as a :
- (A) frame filter (B) packet filter
(C) both (A) and (B) (D) none of the mentioned

44. A logic circuit that provides a HIGH output for both inputs HIGH or both inputs LOW :
- (A) Ex-OR gate (B) Ex-NOR gate
(C) OR gate (D) NOR gate
45. When referring to instruction words, a mnemonic is?
- (A) Shorthand for machine language
(B) A short abbreviation for the data word stored at the operand address
(C) A short abbreviation for the operand address
(D) A short abbreviation for the operation to be performed
46. Dijkstra's Banking algorithm in an operating system solves the problem of :
- (A) Deadlock Avoidance (B) Deadlock Recovery
(C) Mutual Exclusion (D) Context Switching
47. Gray code equivalent of $(1000)_2$ is :
- (A) $(1111)_G$ (B) $(1100)_G$
(C) $(1000)_G$ (D) None of these
48. Which operator is used by Java run time implementations to free the memory of an object when it is no longer needed?
- (A) Delete (B) Free
(C) New (D) None of the mentioned
49. In which ARQ, when a NAK is received, all frames sent since the last frame acknowledged are retransmitted?
- (A) Stop-and-wait (B) Go-back-N
(C) Selective-Reject (D) Both (A) and (B)
50. A Noiseless 3 kHz channel transmits bits with binary level signals. What is the maximum data rate?
- (A) 3 kbps (B) 6 kbps
(C) 12 kbps (D) 24 kbps
51. When an instruction is read from the memory, it is called?
- (A) Memory Read cycle (B) Fetch cycle
(C) Instruction cycle (D) Memory write cycle

52. An HTML form is to be designed to enable purchase of office stationery. Required items are to be selected (Checked). Credit card details are to be entered and then the submit button is to be pressed. Which of the following options would be appropriate for sending the data to the server?

Assume that security is handled in a way that is transparent to the form design :

- (A) Only GET (B) Only POST
(C) Either of GET or POST (D) Neither GET nor POST

53. Consider different activities related to E-Mail.

m1 : Send an e-mail from a mail Client to a mail Server

m2 : Download an e-Mail from mailbox to a mail client

m3 : Checking e-mail in a web browser

Which is the application level protocol used in each activity?

- (A) m1 : HTTP m2 : SMTP m3 : POP
(B) m1 : SMTP m2 : FTP m3 : HTTP
(C) m1 : SMTP m2 : POP m3 : HTTP
(D) m1 : POP m2 : SMTP m3 : IMAP

54. In an IP packet, the value of HLEN is 5_{16} and the value of the total length field is 0028_{16} . How many bytes of data are being carried by this packet?

- (A) 8 Bytes (B) 40 Bytes
(C) 64 Bytes (D) 20 Bytes

55. In asymmetric key cryptography, the private key is kept by :

- (A) sender
(B) receiver
(C) sender and receiver
(D) all the connected devices to the network

56. DES encrypts data in block size of _____ bits each.

- (A) 64 (B) 128
(C) 32 (D) 56

57. Which is true for a typical RISC architecture?
- (A) Micro programmed control unit
 - (B) Instruction takes multiple clock cycles
 - (C) Have few registers in CPU
 - (D) Emphasis on optimizing instruction pipelines
58. A top to bottom relationship among the items in a database is established by a :
- (A) Hierarchical Schema
 - (B) Network Schema
 - (C) Relational Schema
 - (D) All of the above
59. In a GSM system BTS and BSC together form :
- (A) Network substation
 - (B) Base Station Subsystem
 - (C) Maintenance subsystem
 - (D) Operational subsystem
60. Mobile phone in roaming is registered in :
- (A) Visitors Location Registry of another MSC
 - (B) Visitors Location Registry of same MSC
 - (C) Home Location Registry of another MSC
 - (D) Home Location Registry of same MSC
61. In a Piconet, there can be upto _____ parked nodes in the net.
- (A) 63
 - (B) 127
 - (C) 255
 - (D) 511
62. Minimum no. of NAND gate required to implement a Ex-OR function is :
- (A) 2
 - (B) 3
 - (C) 4
 - (D) 5
63. A circuit in which connections to both AND and OR arrays can be programmed is called :
- (A) RAM
 - (B) ROM
 - (C) PAL
 - (D) PLA

64. Consider the schema $R = (S\ T\ U\ V)$ and the dependencies :
 $S \rightarrow T, T \rightarrow U, U \rightarrow V$ and $V \rightarrow S$
 If $R = (R1$ and $R2)$ be a decomposition such that $R1 \cap R2 = \varnothing$, then decomposition is
- (A) Not in 2NF (B) In 2NF but not in 3NF
 (C) In 3NF but not in 2NF (D) In both 2NF and 3NF
65. A flip flop is a :
- (A) Combinational circuit (B) Memory element
 (C) Arithmetic element (D) Memory or arithmetic
66. Which of the following is TRUE?
- (A) Every relation in 3NF is also in BCNF
 (B) A relation R is in 3NF if every non-prime attribute of R is fully functionally dependent of every Key of R
 (C) Every relation in BCNF is also in 3NF
 (D) No relation can be in both BCNF and 3NF
67. Offset value of the Code segment :
- (A) Base pointer (B) Stack pointer
 (C) Instruction pointer (D) None
68. A JK flip-flop can be implemented using D flip-flop connected such that :
- (A) $D = J\bar{Q} + \bar{K}Q$ (B) $D = \bar{J}Q + K\bar{Q}$
 (C) $D = \bar{J}\bar{Q} + KQ$ (D) $D = J\bar{Q} + K\bar{Q}$
69. In a software project, COCOMO (Cost Constructive Model) is used to estimate :
- (A) Effort and Duration based on the Size of the software
 (B) Size and Duration based on the Effort of the software
 (C) Effort and Cost based on Duration of the software
 (D) Size, Effort and Duration based on the Cost of the Software
70. Arithmetic shift left operation :
- (A) Produces the same result as obtained with logical shift left operation
 (B) Causes the sign bit to remain always unchanged
 (C) Needs additional hardware to preserve the sign bit
 (D) Is not applicable for signed 2's complement representation

71. Segment number : defines :

- (A) Distance from the beginning to a particular location in the segment
- (B) The ending of the segment within the memory space
- (C) The starting of the segment within the memory space
- (D) None of the above

72. How can you create a node for comment in JavaScript?

- (A) comment()
- (B) createComment()
- (C) Comm()
- (D) None of the mentioned

73. Which microprocessor pins are used to request and acknowledge a DMA transfer?

- (A) reset and ready
- (B) ready and wait
- (C) HOLD and HLDA
- (D) None of these

74. Consider the following JAVA program segment :

```
try
{
    int x =0 ;
    int y = 5/x;
}
catch (Exception e)
{
    System.out.println("Exception");
}
catch(ArithmeticException ae)
{
    System.out.println("Arithmetic Exception");
}
System.out.println("finished");
```

What will be the output of the code segment?

- (A) Finished
- (B) Exception
- (C) Compilation fails
- (D) Arithmetic Exception

75. Which activity does not take place during execution cycle?

- (A) ALU performs the arithmetic & logical operation
- (B) Effective address is calculated
- (C) Next instruction is fetched
- (D) Branch address is calculated & Branching conditions are checked

76. SD RAM refers to :
- (A) Synchronous DRAM (B) Static DRAM
(C) Semi DRAM (D) Second DRAM
77. A system has 3 processes sharing 4 resources. If each process needs a maximum of 2 units, then :
- (A) Deadlock can never occur (B) Deadlock may occur
(C) Deadlock has to occur (D) None of the above
78. Cache memory works on the principle of :
- (A) Locality of data (B) Locality of reference
(C) Locality of memory (D) Locality of reference & memory
79. Consider a logical address space of 8 pages of 1024 words mapped into memory of 32 frames. How many bits are there in the logical address?
- (A) 9 bits (B) 11 bits
(C) 13 bits (D) 15 bits
80. In a virtual memory system, the addresses used by the programmer belongs to :
- (A) Memory space (B) Physical addresses
(C) Address space (D) Main memory address
81. What will be the output of the following PHP code?
- ```
<?php
$a=5;
$b=5;
echo ($a === $b) ;
?>
```
- (A) 5 === 5 (B) error  
(C) 1 (D) False

82. Determine the number of page faults when references to pages occur in the following order : 1, 2, 4, 5, 2, 1, 2, 4. Assume that the main memory can accommodate 3 pages and the main memory already has the pages 1 and 2, with page 1 having been brought earlier than page 2. (LRU algorithm is used)

- (A) 3 (B) 5  
(C) 4 (D) None of the above

83. Which of the following statements is FALSE?

- (A) Segmentation suffers from external fragmentation  
(B) Paging suffers from internal fragmentation  
(C) Segmented memory can be paged  
(D) Virtual memory is used only in multi-user systems

84. Ready pin of a microprocessor is used :

- (A) To indicate that the microprocessor is ready to receive inputs  
(B) To indicate that the microprocessor is ready to receive outputs  
(C) To provide direct memory access  
(D) To introduce wait states

85. An operating system uses Shortest Remaining Time first (SRT) process scheduling algorithm. Consider the arrival times and execution times for the following processes :

| Process | Execution Time | Arrival Time |
|---------|----------------|--------------|
| P1      | 20             | 0            |
| P2      | 25             | 15           |
| P3      | 10             | 30           |
| P4      | 15             | 45           |

What is the total waiting time for process P2?

- (A) 5 (B) 15  
(C) 40 (D) 55

86. Let  $R(a, b, c)$  and  $S(d, e, f)$  be two relations in which  $d$  is the foreign key of  $S$  that refers to the primary key of  $R$ . Consider the following four operations  $R$  and  $S$  :

- I. Insert into  $R$
- II. Insert into  $S$
- III. Delete from  $R$
- IV. Delete from  $S$

Which of the following can cause violation of the referential integrity constraint above?

- (A) Both I and IV
- (B) Both II and III
- (C) All of the above
- (D) None of the above

87. Given a class named student, which of the following is a valid constructor declaration for the class?

- (A) Student (student s) {}
- (B) Student student () {}
- (C) Private final student () {}
- (D) Void student () {}

88. A binary tree  $T$  has  $n$  leaf nodes. The number of nodes of degree 2 in  $T$  is :

- (A)  $\log_2 n$
- (B)  $2n$
- (C)  $n$
- (D)  $2^n$

89. Following sequence of operations is performed on a stack **push(1), push(2), pop(), push(1), push(2), pop(), pop(), pop(), push(2), pop()**. The sequence of popped out values are :

- (A) 2,2,1,1,2
- (B) 2,2,1,2,2
- (C) 2,1,2,2,1
- (D) 2,1,2,2,2

90. What can be said about the array representation of a circular queue when it contains only one element?

- (A) FRONT = REAR+1
- (B) FRONT = REAR-1
- (C) FRONT = REAR = Null
- (D) None of these

91. In the Spiral model of Software development, the primary determinant in selecting activities in each iteration is :
- (A) Iteration Size
  - (B) Cost
  - (C) Adopted process such as Relational Unified Process or Extreme Programming
  - (D) Risk
92. A software organization has been assessed at SEICMM level 4. Which of the following does the organization need to practice beside Process Change Management and Technology Change Management in order to achieve Level 5?
- (A) Defect Detection
  - (B) Defect Prevention
  - (C) Defect Isolation
  - (D) Defect propagation
93. The extent to which a software can control to operate correctly despite the introduction of invalid input is called as :
- (A) Reliability
  - (B) Robustness
  - (C) Fault tolerance
  - (D) Portability
94. Consider the following code segment in JAVA :

```
class X implements Runnable
{
 public static void main(String args[])
 {
 /*Missing code? */
 }
 public void run() {}
}
```

Which of the following line of code is suitable to start a thread?

- (A) Thread t = new Thread(X);
- (B) Thread t = new Thread(X); t.start();
- (C) X run = new X( ); Thread t = new Thread(run); t.start();
- (D) Thread t = new Thread(); x.run();

