



**CBRT - 2020
Question Paper Grid**

Government of Goa

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Set Name

Subjects

Display

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Itemcode : **IT1001**

Q1 : Java _____ is a language of machine instructions understood by the java virtual machine and usually generated (compiled) from Java language source code.

- (a) Javap
(b) Applet
(c) Beans
(d) Bytecode

Key: **D**

Itemcode : **IT1002**

Q2 : Which of the following statement is true:

- (a) The result of the expression (1+2+"3") would be the string "33".
(b) The result of the expression (4+1.0f) would be the float value 5.0.
(c) The result of the expression (10/9) would be the int value 1.
(d) All of these.

Key: **D**

Itemcode : **IT1003**

Q3 : Consider the following C program:

```
main()
{
  int j=7, *i=&j;
  if (0 == fork())
    *i = (*i +10);
  else
  {
    wait(0);
    printf("%d", *i);
  }
}
```

The value of i that will be printed will be:

- (a) 10
(b) 7
(c) 17
(d) None of the above

Key: **B**

Itemcode : **IT1004**

Q4 : A box contains 10 screws, 3 of which are defective. Two screws are drawn at random with replacement. The probability that none of the two screws will be defective is:

- (a) 100%
(b) 49%
(c) 50%
(d) None of these

Key: **D**

Itemcode : **IT1005**

Q5 : Solution of recurrence relation $a_r - 5a_{r-1} + 8a_{r-2} - 4a_{r-3} = 0$ is:

- (a) $a_r = A_1(1)^r + (A_2 + A_3r) (2)^r$
(b) $a_r = A_1(1)^r + A_2(2)^r$
(c) $a_r = A_1(2)^r + (A_2 + A_3r)(1)^r$
(d) None of the above

Key: **A**

Itemcode : **IT1006**

Q6 : $(101011)_2 = (53)_b$ then b is equal to:

- (a) 4
(b) 8
(c) 10
(d) 16

Key: **B**

Itemcode : **IT1007**

Q7 : What is the time required to insert an element in a stack with linked implementation?

- (a) $O(\log_2 n)$
(b) $O(n)$
(c) $O(n \log_2 n)$
(d) $O(1)$

Key: **D**

Itemcode : **IT1008**

Q8 : Banker's algorithm is used for _____ purpose.

- (a) Deadlock avoidance
(b) Deadlock removal
(c) Deadlock prevention
(d) Deadlock continuation

Key: **A**

Itemcode : IT1009**Q9 :** Which traversal technique lists the nodes of a binary search tree in ascending order:

- (a) Post-order
- (b) In-order
- (c) Pre-order
- (d) Linear order

Key: **B****Itemcode : IT1010****Q10 :** The answer of the operation $(10111)_2 * (1110)_2$ in hex equivalence is:

- (a) 150
- (b) 241
- (c) 142
- (d) 101011110

Key: **C****Itemcode : IT1011****Q11****:** Match the following:

- | | | | |
|------|-----------------------|----|--|
| i. | Determinants | a. | No attribute can be added |
| ii. | Candidate key | b. | Uniquely identifies a row |
| iii. | Non-redundancy | c. | A constraint between two attributes |
| iv. | Functional dependency | d. | A group of attributes on the left hand side of arrow of functional dependency. |

- (a) i - d; ii - b; iii - a; iv - c
- (b) ii - d; iii - a; i - b; iv - c
- (c) iv - a; iii - b; ii - c; i - d
- (d) iii - a; iv - b; i - c; ii - d

Key: **A****Itemcode : IT1012****Q12 :** Another name of IEEE 802.11.a is _____.

- (a) Wi-max
- (b) Fast ethernet
- (c) Wi-Fi
- (d) 802.11g

Key: **A****Itemcode : IT1013****Q13 :** What does the URL need to access documents?

- I. Path name
- II. Host name
- III. DNS
- IV. Retrieval method
- V. Server port number

- (a) I, II, III
- (b) I, III, V
- (c) I, II, IV
- (d) III, IV, V

Key: **B****Itemcode : IT1014****Q14 :** B+ tree is preferred to binary tree in database because:

- (a) Disk capacities are greater than memory capacities
- (b) Disk access is much slower than memory access
- (c) Disk data transfer rates are much less than memory data transfer rate.
- (d) Disk are more reliable than memory

Key: **B****Itemcode : IT1015****Q15 :** Remote computing service involves the use of time sharing and _____.

- (a) multi-processing
- (b) interactive processing
- (c) batch processing
- (d) real-time processing

Key: **B****Itemcode : IT1016****Q16 :** Which one of the following statements is false:

- (a) Context-free languages are closed under union
- (b) Context-free languages are closed under concatenation.
- (c) Context-free languages are closed under intersection.
- (d) Context-free languages are closed under Kleene closure.

Key: **C****Itemcode : IT1017****Q17 :** Which of the following binary number is the same as its 2's complement:

- (a) 1010
- (b) 1000
- (c) 0101
- (d) 1001

Key: **C****Itemcode : IT1018****Q18 :** Which of the following logic families is well suited for high-speed operations?

- (a) TTL
- (b) ECL
- (c) MOS
- (d) CMOS

Key: **B**Itemcode : **IT1019****Q19** : 8085 microprocessor has ____ hardware interrupts:

- (a) 2
- (b) 3
- (c) 4
- (d) 5

Key: **D**Itemcode : **IT1020****Q20** : Consider the following page trace: 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 5. Percentage of page fault that would occur if FIFO page replacement algorithm is used with number of frames for the job m=4 will be:

- (a) 8
- (b) 9
- (c) 10
- (d) 12

Key: **C**Itemcode : **IT1021****Q21** : A packet whose destination is outside the local TCP/IP network segment is sent to:

- (a) File Server
- (b) DNS Server
- (c) DHCP Server
- (d) Default gateway

Key: **D**Itemcode : **IT1022****Q22** : Consider the following statements related to compiler construction:-

- I. Lexical analysis is specified by context-free grammars and implemented by pushdown automata.
- II. Syntax analysis is specified by regular expressions and implemented by finite-state machine.

which of the above statement(s) is/are correct:

- (a) Only I
- (b) Only II
- (c) Both I and II
- (d) Neither I nor II

Key: **D**Itemcode : **IT1023****Q23** : For a database relation R(A, B,C, D) where the domains of A, B, C and D include only atomic values, only the following functional dependencies and those that can be inferred from them are:A \rightarrow CB \rightarrow D

The relation R is in _____.

- (a) First normal form but not in second normal form.
- (b) Both in first normal form as well as in second normal form.
- (c) Second normal form but not in third normal form.
- (d) Both is second normal form as well as in third normal form.

Key: **A**Itemcode : **IT1024****Q24** : Any decision tree that sorts n elements has height:

- (a) $\Omega(\log n)$
- (b) $\Omega(n)$
- (c) $\Omega(n \log n)$
- (d) $\Omega(n^2)$

Key: **C**Itemcode : **IT1025****Q25** : Which of the given wireless technologies used in IoT consumes the least amount power?

- (a) Zigbee
- (b) Bluetooth
- (c) Wi-Fi
- (d) GSM/ CDMA

Key: **B**Itemcode : **IT1026****Q26** : The following numbers are inserted into an empty binary search tree in the given order: 10,1, 3, 5, 15, 12, 16. What is the height of the binary search tree?

- (a) 3
- (b) 4
- (c) 5
- (d) 6

Key: **A**Itemcode : **IT1027****Q27** : Which of the following testing techniques ensure that the software product runs correctly after the changes during maintenance:

- (a) Path testing
- (b) Integration testing
- (c) Unit testing
- (d) Regression testing

Key: **D**Itemcode : **IT1028****Q28** : The function represented by Karnaugh map given below is:

		BC			
		00	01	11	10
A	0	1	0	0	1
	1	1	0	0	1

- (a) A.B
 (b) $AB + BC + CD$
 (c) $B + C$
 (d) C
 Key: **D**

Itemcode : **IT1029**

Q29 : The multiplexer with 4-bit data input is a:

- (a) 4:1 multiplexer
 (b) 2:1 multiplexer
 (c) 16:1 multiplexer
 (d) 8:1 multiplexer
 Key: **A**

Itemcode : **IT1030**

Q30 : When a subroutine is called, then address of the instruction following the CAL instruction is stored in the:

- (a) Stack pointer
 (b) Program counter
 (c) Accumulator
 (d) Stack
 Key: **A**

Itemcode : **IT1031**

Q31 : The booth algorithm
 (I) generates 2n-bit product
 (II) treats both positive and negative 2's complement n-bit operand uniformly.

- (a) I
 (b) II
 (c) I, II
 (d) Neither I nor II
 Key: **C**

Itemcode : **IT1032**

Q32 : Increasing the RAM of a computer typically improves performance because:

- (a) Virtual memory increases
 (b) Large RAM's are faster
 (c) Fewer segmentation faults
 (d) Fewer page faults occur.
 Key: **D**

Itemcode : **IT1033**

Q33 : Thrashing:

- (a) always occur on large computers
 (b) is a natural consequence of virtual memory systems
 (c) can always be avoided by swapping
 (d) can be caused by poor paging algorithm
 Key: **D**

Itemcode : **IT1034**

Q34 : Which operator has highest priority:

- (a) ()
 (b) []
 (c) \rightarrow
 (d) .
 Key: **A**

Itemcode : **IT1035**

Q35 : The keyword 'typedef' is used to:

- (a) declare a member function that is defined in a subclass
 (b) designation of the absence of a type
 (c) declare objects that can be modified outside of program control
 (d) declare a synonym for an existing type
 Key: **D**

Itemcode : **IT1036**

Q36 : In general, in a recursive and non-recursive implementation of a problem(program):

- (a) Both time and space complexities are better in recursive than in non-recursive program.
 (b) Both time and space complexities are better in non-recursive than in recursive program.
 (c) Time complexity is better in recursive version but space complexity is better in non-version recursive of the program
 (d) Space complexity is better in recursive version but time complexity is better in non-recursive version of the program
 Key: **B**

Itemcode : **IT1037**

Q37 : Which layers of the OSI reference model are host-to-host layers:

- (a) Transport, Session, Presentation, Application
 (b) Network, Transport, Session, Presentation
 (c) Data-link, Network, Transport, Session
 (d) Physical, Data-link, Network, Transport
 Key: **A**

Itemcode : **IT1038**

Q38 : A scheduling algorithm assigns priority proportional to the waiting time of a process. Every process starts with the priority zero (lowest priority). The scheduler re-evaluates the process priority for every 'T' time units and decides next process to be scheduled. If the process have no I/O operations and all arrive at time zero, then the scheduler implements _____ criteria:

- (a) Priority scheduling
 (b) Round Robin scheduling
 (c) Shortest Job First

(d) FCFS
Key: **B**

Itemcode : **IT1039**

Q39 : In C++, polymorphism requires:

- (a) Inheritance only
 - (b) Virtual functions only
 - (c) References only
 - (d) Inheritance, Virtual functions and References
- Key: **D**

Itemcode : **IT1040**

Q40 : The following 'C' statement:
int * f[]();
declares:

- (a) A function returning a pointer to an array of integers
 - (b) Array of functions returning pointers to integers
 - (c) A function returning array of pointers to integers
 - (d) An illegal statement
- Key: **B**

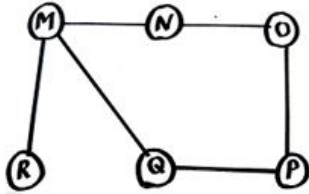
Itemcode : **IT1041**

Q41 : To implement Dijkstra's shortest path algorithm on unweighted graph so that it runs in linear time, then data structure to be used is:

- (a) Queue
 - (b) Stack
 - (c) Heap
 - (d) B-tree
- Key: **C**

Itemcode : **IT1042**

Q42 : The BFS algorithm has been implemented using the queue data structure. One possible order of visiting the nodes of the following graph is:



- (a) MNOPQR
 - (b) NQMPOR
 - (c) QMNPOR
 - (d) QMNPOR
- Key: **C**

Itemcode : **IT1043**

Q43 : What is the disadvantage of connection oriented protocol such as TCP:

- (a) Packet acknowledgement might add overhead
 - (b) Packets are not tagged with sequence numbers
 - (c) Loss or duplication of data packets more likely to occur
 - (d) The application layer must assume the responsibility for the correct sequencing of data packets.
- Key: **A**

Itemcode : **IT1044**

Q44 : In which of the following applications can we use deep learning to solve the problem?

- (a) Protein structure prediction
 - (b) Prediction of chemical reactions
 - (c) Detection of exotic particles
 - (d) All of these
- Key: **D**

Itemcode : **IT1045**

Q45 : Cross compiler is a compiler:

- (a) that generates object code for its host machine
 - (b) that runs on one machine and produces object code for another machine
 - (c) which is written in a language that is the same as the source language
 - (d) which is written in a language that is different from the source language
- Key: **B**

Itemcode : **IT1046**

Q46 : A thread:

- (a) is a light weight process where the context switching is high.
 - (b) is a light weight process where the context switching is low.
 - (c) is used to speed up paging.
 - (d) none of the above.
- Key: **A**

Itemcode : **IT1047**

Q47 : Which of the following statement is not true regarding JavaScript?

- (a) JavaScript is a loosely typed language
 - (b) JavaScript is an object based language
 - (c) JavaScript is event driven
 - (d) JavaScript embedded in an HTML document is compiled and executed by the client browser
- Key: **D**

Itemcode : **IT1048**

Q48 : The recurrence relation capturing the optimal execution time of the Towers of Hanoi problem with n discs is:

- (a) $T(n) = 2T(n-2) + 2$
 - (b) $T(n) = 2T(n-1) + n$
 - (c) $T(n) = 2T(n/2) + 1$
 - (d) $T(n) = 2T(n-1) + 1$
- Key: **D**

Itemcode : **IT1049**

Q49 : The following are some sequences of operations in instruction cycle, which one is correct sequence?

(a) PC → Address register

Data from memory → Data register

Data register → IR

PC + 1 → PC

(b) Address register → PC

Data register → Data from memory

Data register → IR

PC + 1 → PC

(c) Data from memory → Data register

PC → Address register

Data register → IR

PC + 1 → PC

(d) None of these

Key: **A**

Itemcode : **IT1050**

Q50 : Which of the following statements is false regarding "Cookies"?

(a) Cookies have the potential of being used to violate the privacy of users

(b) Cookies cannot contain more than 4Kb of data

(c) Cookies are programs which run in the background of the web-client

(d) Cookies usually contain data in the form of name-value pairs

Key: **C**

Itemcode : **IT1051**

Q51 : Who is the author of 'Dreams of a Billion: India and the Olympic Games'?

(a) Ram Singh

(b) Nalin Mehta

(c) Chetan Bhagat

(d) Baggi Anveil

Key: **B**

Itemcode : **IT1052**

Q52 : How many commercial satellites have been launched by ISRO along with RISAT-2BR1?

(a) 7

(b) 9

(c) 10

(d) 12

Key: **B**

Itemcode : **IT1053**

Q53 : The National Unity Day is celebrated every year on which of the following date?

(a) October 31

(b) October 30

(c) October 29

(d) October 20

Key: **A**

Itemcode : **IT1054**

Q54 : The famous "Chatham Saw Mill" is located in which among the following states / union territories of India?

(a) Daman & Diu

(b) Goa

(c) Andaman & Nicobar

(d) Laskhadweep

Key: **C**

Itemcode : **IT1055**

Q55 : One kilobyte (KB) is equal to

(a) 1,000 bits

(b) 1,024 byte

(c) 1,024 megabytes

(d) 1,024 gigabytes

Key: **B**

Itemcode : **IT1056**

Q56 : The concentration of which gas is highest in our environment?

(a) Oxygen

(b) Hydrogen

(c) Nitrogen

(d) Carbon dioxide

Key: **C**

Itemcode : **IT1057**

Q57 : In which field of Art Jamini Roy make his name?

(a) Music

(b) Drama

(c) Sculpture

(d) Painting

Key: **D**

Itemcode : **IT1058**

Q58 : Goa Shipyard Limited (GSL) was established in

- (a) 1972
 (b) 1957
 (c) 1962
 (d) 1965
 Key: **B**

Itemcode : IT1059

Q59 : Which country produces the most rubber in the world?

- (a) Vietnam
 (b) Malaysia
 (c) Thailand
 (d) India

Key: **C**

Itemcode : IT1060

Q60 : The venue for Summer Olympics in year 2020 is _____

- (a) Paris
 (b) Tokyo
 (c) Qatar
 (d) Sydney

Key: **B**

Itemcode : IT1061

Q61 : In each of the following questions a statement is given, followed by two conclusions. Give answer :

Statement : Today out of the world population of several thousand million, the majority of men have to live under governments which refuse them personal liberty and the right to dissent.

Conclusion :

- I. People are indifferent to personal liberty and the right to dissent.
 II. People desire personal liberty and the right to dissent.

- (a) Only conclusion I follows.
 (b) Only conclusion II follows.
 (c) Either I or II follows.
 (d) Neither I or II follows.

Key: **B**

Itemcode : IT1062

Q62 : Among Praveen, Pravat, Pankaj, Pratap, and Prakash, each having different weight, D is heavier than only A and C is lighter than B and E. Who among them is the heaviest?

- (a) Pravat
 (b) Pankaj
 (c) Prakash
 (d) Data inadequate

Key: **C**

Itemcode : IT1063

Q63 : From the following numbers given, find the one that does not belong to the group.

- (a) 215
 (b) 143
 (c) 247
 (d) 91

Key: **A**

Itemcode : IT1064

Q64 : QLR, JPD, RNU, GNC, SPX, DLB, ___

- (a) ARE
 (b) AJA
 (c) BTU
 (d) TRA

Key: **D**

Itemcode : IT1065

Q65 : PKC, SPF, XSK, AXN, ___, IFV

- (a) CAQ
 (b) FCS
 (c) FAS
 (d) CFS

Key: **C**

Itemcode : IT1066

Q66 : GTB, CYV, YDP, ___, QND

- (a) DIV
 (b) UIJ
 (c) DDV
 (d) UVV

Key: **B**

Itemcode : IT1067

Q67 : Here are some words translated from an artificial language.

godabim means kidney stones
 romzbim means kidney beans
 romzbako means wax beans
 Which word could mean "wax statue"?

- (a) godaromz
 (b) lazvim
 (c) wasibako
 (d) romzpeo

Key: **C**

Itemcode : IT1068

Q68 : Here are some words translated from an artificial language.

granamelke means big tree
 pinimelke means little tree

melkehoon means tree house

Which word could mean "big house"?

- (a) granahoon
- (b) pinishur
- (c) pinihoon
- (d) melkegrana

Key: **A**

Itemcode : **IT1069**

Q69 : Here are some words translated from an artificial language.

lelibroon means yellow hat

plekafroti means flower garden

frotimix means garden salad

Which word could mean "yellow flower"?

- (a) lelifroti
- (b) lelipleka
- (c) plekabroon
- (d) frotibroon

Key: **B**

Itemcode : **IT1070**

Q70 : Here are some words translated from an artificial language.

myncabel means saddle horse

conowir means trail ride

cabelalma means horse blanket

Which word could mean "horse ride"?

- (a) cabelwir
- (b) conocabel
- (c) almamyn
- (d) conoalma

Key: **A**

Passage:

Read the following passage and answer the questions below

In the Roman times, defected enemies were generally put to death as criminals for having offended the emperor of Rome. In the middle ages, however, the practice of ransoming or returning prisoners in exchange for money became common. Though some saw this custom as a step towards a most humane society, the primary reasons behind it were economic rather than humanitarian.

In those times, rulers had only a limited ability to raise taxes. They could neither force their subject to fight nor pay them to do so. The promise of material compensation in the form of goods and ransom was therefore the only way of inducing combatants to participate in a war. In the middle ages, the predominant incentive for the individual soldiers was the expectation of spoils. Although collecting ransom clearly brought financial gain, keeping a prisoner and arrange for his exchange had its cost. Consequently, procedures were devised to reduce transaction costs.

One such device was a rule asserting that the prisoner had to assess his own value. This compelled the prisoner to establish a value without too much distortion; indicating too low a value would increase, the captive's chances of being killed, while indicating too high a value would either ruin him financially or create a prohibitively expensive ransom that would also result in death

Itemcode : **IT1071**

Q71 : It can be inferred from the passage that a medieval soldier

- (a) was less likely to kill captured members of opposing armies than was a soldier of the Roman Empire
- (b) was similar to a 20th century terrorist in that he operated on a basically independent level and was motivated solely by economic incentives
- (c) had few economic options and chose to fight because it was the only way to earn an adequate living
- (d) was motivated to spare prisoners' lives by humanitarian rather than economic ideals

Key: **A**

Itemcode : **IT1072**

Q72 : Which of the following best describes the change in policy from executing prisoners in Roman times to ransoming prisoners in the middle ages?

- (a) The emperors of Rome demanded more respect than did medieval rulers and thus Roman subjects went to greater lengths to defend their nation
- (b) it was a reflection of the lesser degree of direct control medieval ruler had over subjects
- (c) It became a show of strength and honour warrior of middle ages to be able to capture and return their enemies
- (d) Medieval soldiers were not as humanitarian as their ransoming practices might have indicated

Key: **B**

Itemcode : **IT1073**

Q73 : The primary purpose of the passage is to

- (a) discuss the economic basis of the medieval practice of exchanging prisoners for ransom
- (b) examine the history of the treatment of prisoner of war
- (c) emphasize the importance of a warrior's code of honour during the middle ages
- (d) explore a way of reducing the cost of ransom

Key: **A**

Itemcode : **IT1074**

Q74 : The author uses the phrase "without too much distortion" in order to

- (a) Indicate that prisoners would fairly assess their worth
- (b) emphasize the important role medieval prisoners played in determining whether they should be ransomed
- (c) explain how prisoners often paid more than an appropriate ransom in order to increase their chances of survival
- (d) suggest that captors and captives often had understanding relationships

Key: **A**

Itemcode : **IT1075**

Q75 : Bring out the meaning of the word 'spoils' in the context of the passage.

- (a) Destroys

(b) Ruins
(c) Rewards
(d) wastes
Key: C